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Research Note 85-69

Soldier Performance in Continuous Operations: Administrative Manual for a Briefing and Seminar for Command and Staff Personnel

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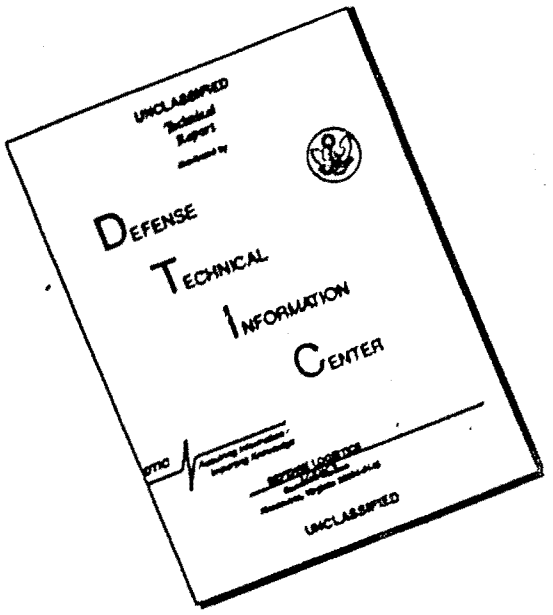

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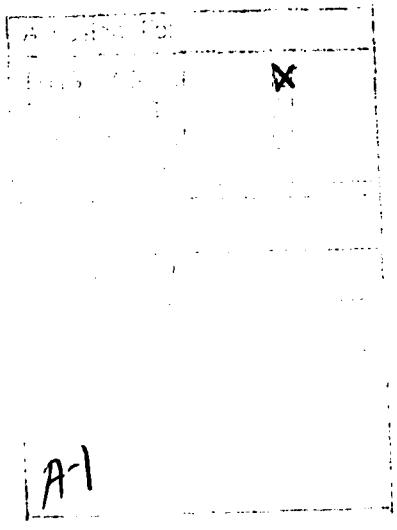

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Stress	Performance degradation	Stress management
Continuous operations	Unit effectiveness	Human resources
Training	Performance maintenance	Endurance
Organizational development	Work/rest planning	
Human factors	Stress control	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

If any Army unit is to meet the demands of continuous operations, a systematic human resources conservation program must be planned and implemented. The details of such a program are described. Without such a program, intolerable levels of performance degradation are projected during continuous operations.

Strategies for countering the anticipated degradation during continuous operations include: leadership training, confidence building, (Continued)

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20. (Continued)

organizing for full communications, behavioral modeling, overtraining and crosstraining, developing physical fitness, and development of performance supports.

Tactics for countering performance degradation during continuous operations include task rotation, task sharing, use of performance supports, proper management of stress, and appropriate work/rest cycles.

The program for integrating these concepts into a unit developmental program includes systematic steps along a time frame. The strategies are set in place during the preparatory stage, and these provide the foundation for implementing the tactics during continuous operations.

ACKNOWLEDGMENTS

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TABLE OF CONTENTS

INTRODUCTION

This manual contains directions for presenting instructions about soldier performance in continuous operations. The manual provides a self-contained package for acquainting senior officers, who have command and staff responsibilities, with the projected degradation of soldier performance in continuous operations, the available Counter Degradation Measures (CDMs) for dealing with this problem, and the factors inherent in appropriate continuous operation policy formulation.

The materials consist of three units:

Unit I - a 33 mm slide presentation, Soldier Performance in Continuous Operations: A Challenge," accompanied by a tape recorded narration. The purpose of this Unit is to introduce participants to the soldier performance degradation in continuous operations problem, to present some techniques for dealing with it, and to suggest some considerations for preparing a continuous operations capability.

Unit II - a discussion leader's statement and elaboration of the meaning of the preceding briefing, and some of the requirements implied by it. Unit II suggests broad requirements and focuses on the issues for satisfying them.

Unit III- a set of seven discussion cases dealing with soldier performance in continuous operations. The cases provide a basis for a problem solving seminar designed to stimulate participants into consideration of specific issues and options for developing a continuous operations capability.

Directions, as well as supporting guidance for the administration of each of these units, are provided successively. Appendix A lists the specific command and staff tasks which the three units, taken as a whole, are designed to support.

Whenever feasible, all three units should be scheduled. Each Unit rests on the foundation provided by prior Units. If sufficient time is not available for administering all three Units, the case presentation and discussion can be curtailed or omitted. If available time is extremely restricted, the presentation can be confined to the briefing portion (Unit I).

References

Discussion leaders should become familiar with, at least, the below listed references. The information contained in them will help the leader to provide authoritative answers to questions, and to inject relevant background information into the discussions. Items 2 and 3 of these references as well as the present materials were developed under supervision of the Soldier Developments Directorate, Fort Benjamin Harrison, the TRADOC element with proponency for soldier performance. Users are encouraged to comment on them, or on any issue of soldier performance to the Soldier Developments Directorate.

1. Human performance in continuous operations:

   I. Human performance guidelines (Research Product 80-4a)

   II. Management guide (Research Product 80-4b)

   III. Technical documentation (Research Product 80-4c)

   U.S. Army Research Institute for the
   Behavioral and Social Sciences
   5001 Eisenhower Avenue
   Alexandria, VA 22333

2. FM22-26-2, Management of Stress in Army Operations

3. FM22-26-XX, Soldier Performance in Continuous Operations

Handouts

Some items of adjunct material appear in Appendix B. It is suggested that sufficient copies of these handouts be reproduced in advance, and that they then be made available to the Briefing/Seminar participants.

Whenever feasible, handouts should be distributed to participants when they are first scheduled to attend the Briefing/Seminar. Ask participants to read and examine them prior to attending the Briefing/Seminar. When prior distribution is not feasible, distribute handouts as participants arrive.

Continuous Operations Training for Platoon and Squad Levels

A set of materials parallel to the present ones, but designed to meet requirements for Platoon and Squad level training have also been prepared. These Platoon and Squad (P & S) materials are available from the same source as the present ones (see p. 5).

The following materials are presented in sequential order in this manual: Unit I--Audio-Visual Presentation, Units II-IV--Classroom Lectures, Unit V--Case Discussion. Then, six separate cases are presented. Appendix A contains lists of the platoon and squad tasks supported by the materials and Appendix B contains adjunct reading materials (handouts).

UNIT I

Audio-Visual Presentation

UNIT I
(Approximate Duration: 60 Minutes)

General

Unit I, a slide/audio tape presentation, reviews expected conditions in potential future warfare and shows how these conditions inevitably degrade the performance of every soldier from commander to footsoldier. The presentation considers the techniques that can be used for retarding the pace of degradation and presents considerations for preparing a continuous operations capability. The purpose is to advise participants about the problems and some means for dealing with them.

While this Unit is intended to be used in combination with succeeding Units, it can be used independently to brief a group of any size. When scheduled for use in combination with the other Units, it is recommended that the group be limited to no more than 18 participants.

The slide/audio tape presentation (35 mm slides and audio, single track tape) is available from:

U.S. Army Soldier Support Center
ATTN: ATZI-NCR-SP
Ft. Benjamin Harrison, IND 46216

Materials

35 mm slide projector
Slide tray of sufficient capacity
77 slides (35 mm) "Soldier Performance in Continuous Operations: A Challenge" (Plus title slides A and B)
Projection screen
Tape cassette player
Tape cassette: "Soldier Performance in Continuous Operations: A Challenge"

Preparation

1. Load sequentially numbered slides into slide tray.

    a. assure correct slide orientation:

        (1) relate slide tray's geometry to projector's
        (2) in the projector, slide image must be "upside down" and matte (emulsion) side toward screen

2. Project loaded slides to assure that all are correctly oriented; after corrections set tray back to first slide (focus sharply).

3. Insert tape cassette into cassette player.

4. Preview the Unit in its entirety before presenting the Unit for the first time.

Presentation Procedure

1. Welcome audience to the briefing (and subsequent seminar) on soldier performance in continuous operations.

S A M P L E

My name is _____.

I am _____.
(state affiliation and role in parent organization)

Welcome to this briefing and seminar on soldier performance in continuous operations. This briefing was prepared by the Soldier Support Center in order to present the basic facts and issues in regard to sustaining soldier combat performance effectiveness during continuous operations.

The material you are about to see reviews the conditions expected in future massive ground warfare and shows how these conditions inevitably degrade the performance of every soldier from commander to foot soldier. It presents techniques for retarding the pace of degradation and presents considerations for preparing a continuous operations capability. As the result of this briefing, you will see the dimensions of the problem and some avenues for approaching it.

2. Turn off lights.

3. Start cassette player; turn on projector.

4. As each click is heard on tape, advance to next slide.

5. At end, turn off cassette player and projector; turn on lights.

6. Announce:

> This completes the audio-visual presentation. Are there any questions or comments?

Discussion Guidance

1. Respond to specific questions factually (e.g., where can I get access to the PERFECT model?--. Answer: ARRADCOM UNIVAC 1108 facility at Aberdeen Proving Ground).

2. Elaborate on general points as requested.

3. Continue this discussion until most, if not all, questions are answered. Some questions may be answered by a statement such as: "That is covered in Unit(s) II and (III) which are scheduled to follow."

4. Propose a brief break period before continuing.

5. Introduce the break with a statement such as: "Let's take a brief break. After that, I (we) have a 20 minute presentation about major policy issues in developing the capability for sustaining soldier performance during continuous operations."

UNIT II

Oral Presentation

UNIT II

General

Unit II is designed for presentation immediately following the discussion period of Unit I. The intent of this Unit is to direct participants' attention to the major policy issues in developing an Army wide capability for sustaining soldier performance during continuous operations. The Unit alerts participants to major potential courses of action they and their commands will need to consider. The objective is to summarize the major implications of the preceding briefing and to set the stage for case dis- cussions in the succeeding unit.

Materials and Procedure

A suggested script for Unit II is presented below. Unit II is a lecture presentation. The discussion leader may read this script or he may deliver his own version of it by relying on the topical cues that accompany each paragraph (left column).

Two slides (Nos. 67 and 69) from the preceding Unit I briefing are included in the Unit II presentation. Show these slides when reference to them is made in the script. Hand out copies of the "chart" before starting.

TEXT OF UNIT II

- Approach to readiness
- Commands/levels responsibilities
- Support for policies/programs

In the briefing, we presented the continuous operations problem and what can be done about it. Now, we want to present an approach to achieving continuous operations readiness, including the matter of support for policies and programs.

- Counter Degradation Measures (CDM) are integral
- CDM fit into time frame
- CDM effectiveness must be developed

Two important points were made in the preceding presentation (Slide No. 67). The first is that the available countermeasures to degradation, or CDMs, are mutually reinforcing and interdependent; they are an integral remedy rather than a package of band-aids. At least for maximum retardation of performance degradation, this is an all-or-none proposition. The second point is that the component CDMs fit into a time frame (Slide No. 69). To be available and to sustain the soldier in continuous combat, the CDMs must have been developed and practiced extensively long before continuous operations are encountered.

- Logic of CDM introduction and development

There is a time frame appropriate to the various CDMs; there is also some order applicable to their introduction and development. This order is suggested by the interdependence of the CDMs on each other. For example, task rotation cannot be instituted unless crosstraining has preceded it.

1. Leadership and commitment provide the motivation for preparation

Begin by demonstrating leadership and guiding soldiers to develop their commitment. Good leadership and soldier commitment provide the motivation that drives a conscientious program of preparation. Each is also a CDM that must be developed to maximum effectiveness during preparation. Leadership provides the basis for sincere commitment.

2. Physical conditioning, stress reduction techniques, and leadership and commitment are the foundations for continuous operations training.

Just as leadership and commitment supply the drive to reach the goals of continuous operations training, physical conditioning and stress reduction skills provide the stamina needed to endure the continuous operations demands made on each soldier. In combination, leadership, commitment, physical conditioning, and stress reduction are the foundations for effective performance during continuous operations

3. Identify special talent early and assign special combat roles

I think you'll agree that it makes sense to spot the soldier's with special abilities or talent in accurate orientation, or detecting enemy infiltration at night. Special roles can be assigned to these persons in accordance with their abilities.

4. Plant and schedule:
   a. task restructuring
   b. task rotation
   c. work/rest cycles
   d. sleep discipline
   e. performance supports

Each of the other CDMs that were enumerated in the briefing, that is, task restructuring, task rotation, work/rest cycles, sleep discipline, and performance supports, depends on some prior development, training, planning, and scheduling. For instance, task restructuring is a response to a contingency, and the specifics of the restructuring need to be planned so that the reorganization of activity can be practiced until it can be executed smoothly. This is true, also, for work/rest cycles and sleep discipline. Task rotation, as we have pointed out several times, depends on prior crosstraining. Finally, performance supports need to be determined, developed, and their use integrated into training. All of these CDMs, in well-developed form, must be "in place" for effective continuous operations training, and they must be repetitively honed to a fine edge within the training experience.

5. The preceding must be "in place" for realistic training in realistic conditions

Full scale training, under realistically simulated continuous operations conditions, requires that each of the prior steps has been accomplished. Realistic training in realistic conditions must incorporate the application of CDMs to the onset of degradation, and, therefore, all of these CDMs must be ready and available.

- Command responsibilities

So far, we have described an orderly approach to achieving continuous operations readiness. This brings us to the considerations and responsibilities for commands and command levels. The chart summarizes these issues.

- MACOMS establish directions and set goals

MACOMS have to take the lead in establishing directions and setting goals for the continuous operations readiness in their commands. As a beginning, the adverse factors associated with continuous operations, their impacts on the effectiveness of soldiers' combat performance, the rates and degrees of performance degradation, and the rest of what the briefing presentation could only sketch broadly will need to be examined in detail. Readiness requirements, priorities, and current status will have to be considered. Directions developed from these considerations will define the readiness objectives, set mandatory training objectives, and, of course, the corresponding evaluation requirements.

- MACOMS must direct mandatory training and evaluation

MACOMS must direct that continuous operations and their full implications be included in all considerations when subordinate units develop their training policies

and programs. Continuous operations should be considered a mandatory training subject, and progress toward achieving the objectives should be evaluated on all ARTEPs and in Annual General Inspections conducted by the MACOM and its subordinate units.

- TRADOC schools must develop:
  a. methods
  b. resources
  c. facilities

TRADOC schools must detail the impact of continuous operations on soldiers' ability to sustain effective combat performance. Detailed data and technical guidance for these purposes is available in reports of the U.S. Army Research Institute for the Behavioral and Social Sciences and in manuals prepared by the Soldier Support Center. This information will provide substantial guidance on training content and practices. Specific training requirements need to be pinpointed, technical guidance for this training must be developed and disseminated, and appropriate evaluation standards need to be established. Consideration needs to be given, also, to requirements for training resources and facilities that continuous operations training will generate.

- TRADOC schools must integrate continuous operations considerations into all training materials

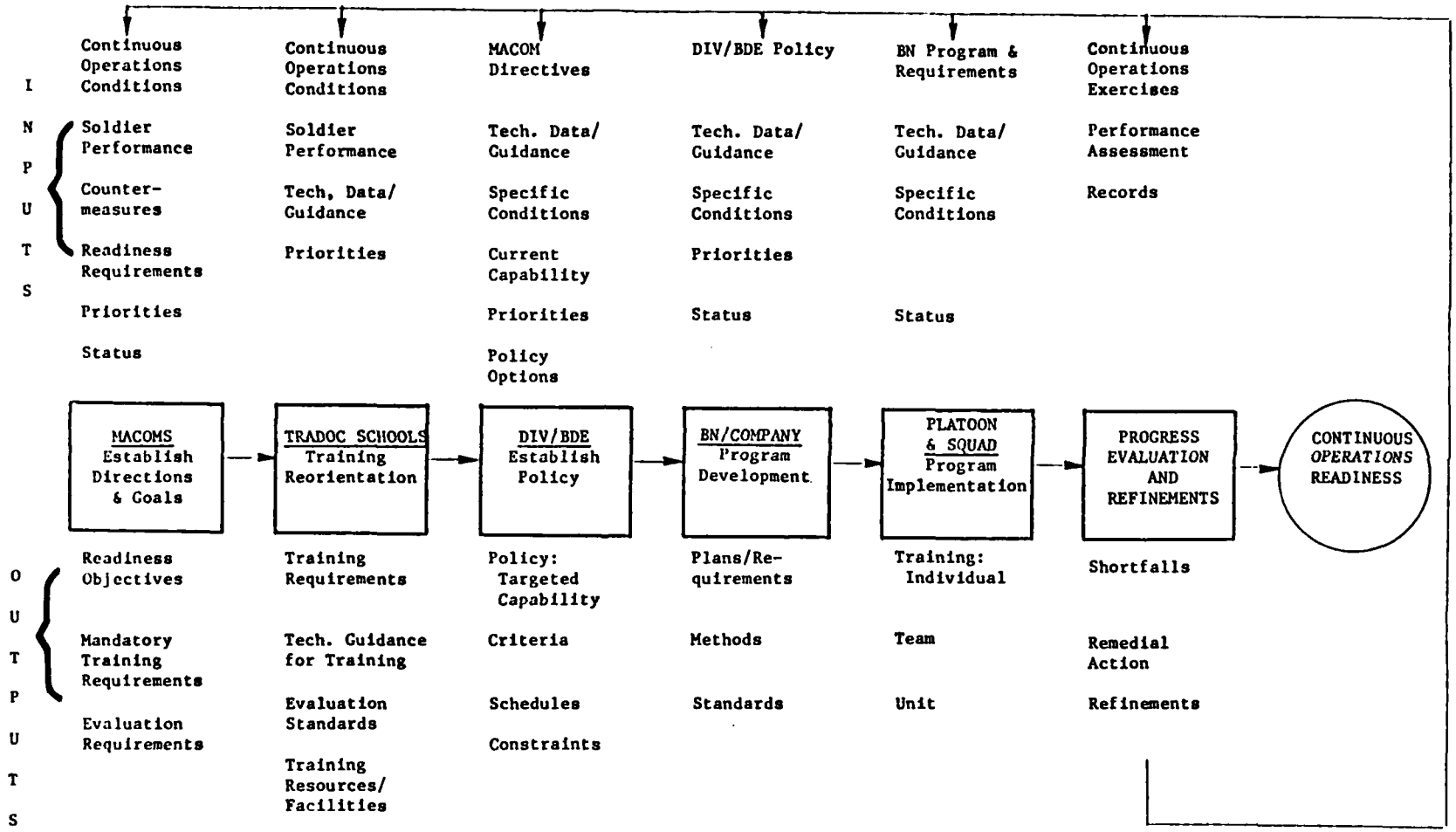
TRADOC schools should integrate the implications of human performance in continuous operations into all applicable training material. All training exercises should be based on realistic scenarios, and they should include an evaluation of units' ability to conduct sustained operations under adverse or exceedingly adverse conditions. ARTEPs must include proper evaluation of the unit's ability to conduct sustained operations under realistic conditions utilizing only resources that are normally available.

- DIV/BDE must develop policy plus general guidelines

Within the framework of MACOM directions and the full range of applicable technical guidance, Division and Brigade will need to consider their particular and specific conditions, their current capacity, and their priorities in formulating their policy options. Division and Brigade must develop a policy, supplemented by general guidelines, which provides battalions with a method for achieving these mandatory training objectives as directed by MACOM.

- Train for "worst case" but only with normal resources

Training exercises and evaluations should be developed, by policy, from a realistic scenario that measures the unit's ability to conduct sustained operations under the most adverse conditions, and with only normally available resources. Published policy must include a clear specification of the targeted capability, criteria by which achievement will be evaluated, schedules, and all applicable constraints.



ACHIEVING CONTINUOUS OPERATIONS READINESS:

A framework for commands and command levels' responsibilities together with considerations (INPUTS) and items of policy (OUTPUTS)

- Bn must design programs per technical guidance

Battalion, of course, must develop a detailed training program faithful to the spirit as well as the letter of received policy. The program must be designed to incorporate the constructive technical guidance regarding sustained soldier effectiveness in continuous operations.

- Bn must schedule specific blocks of training time for CDM and CDM combinations

Schedules must assure that specific blocks of training time are devoted to the various CDMs, singly and in combination, and in concordance with an orderly implementation time line.

- Monitor program
- Assess frequently
- Determine reasons for shortfalls
- Direct specific remedial action

As we recognize, units do best the things that the boss checks most. While this applies to all levels, it is most important at the Battalion level because it supervises implementation or program execution directly. The implementation needs to be monitored, and progress needs to be assessed on an ongoing basis. We know that this is not new to you. The point to which we want to direct your attention is that assessments need to be made with high frequency, that records need to be kept, that performance must be assessed systematically, and that shortfalls need to be treated diagnostically. Don't tell them that they're not good enough; tell them how to do it better. Specify the remedial actions to be taken and the refinements to be introduced that will enable subordinate units to reach or exceed the training goals. Give them the benefit of management analysis and guidance.

- Company/Platoon/Squad implement programs

Whatever problems of policy and programs may beset higher command levels, the day-to-day implementation of a continuous operations training program is a company, platoon, and squad level concern. This presents a challenge to the leadership at each of these levels.

- A realistic program entails dedication

If that leadership does not step off on the right foot, if it does not inspire dedication by word and example, if it does not demonstrate the highest order of professionalism, the genuine requirements for a continuous operations capability will not be met.

SUMMARY

In summary, programs for developing a continuous operations capability have a logic of their own. To achieve a genuine capability, policies and programs must be realistic so as to match the conditions to be expected. Each level and type of command must contribute to the achievement of a continuous operations readiness. However, the toughest job is to implement the program and make it work effectively. This fact deserves clear recognition, and these efforts need to be given the strongest support that can be mustered.

UNIT III

Case Discussions

UNIT III

Section 1--General

Unit III is composed of a set of cases which are designed to support a case method of instruction about issues involved in developing and implementing policy for sustaining soldier performance in continuous operations. This Unit should be introduced only after participants have been exposed to preceding Units

The case discussions which constitute this Unit provide a simulated command and staff environment for exploring issues associated with the development of a continuous operations capability. The objective is to sensitize participants to the complex of factors that need to be considered in developing policy at various levels of command and for various types of combat arms units. Also, the cases are designed to introduce situations representative of various stages within a time frame extending from peacetime through a transition period into actual continuous combat. Accordingly, the implications of soldiers' deteriorating combat performance capabilities are developed with reference to various points in the time frame.

Organization of Subsequent Text

Section 2 presents the information needed for implementing the case method. Hints which will assist the case leader in the conduct of the case discussions are also included.

Section 3 contains the actual case materials together with guidance for the presentor or discussion leader.

Section 2--Case Leader's Information

Unit III of the sequence is composed of seven cases which provide practice in solving some of the problems inherent in implementing a program devoted to achieving continuous operations capability. The Unit is based on the case method of instruction. Completion of the Unit will provide a fuller perspective about the implications of soldier performance degradation within the continuous operations doctrine and an opportunity to exchange views about common problems and their solutions.

The Case Method

The case method of instruction is widely used in the advanced study of medicine, business, public administration, international relations, and, of course, military science. Often, formal instruction seeks to present specific facts and/or procedures for achieving clearly specifiable objectives. For some purposes, however, specific facts and procedures cannot be delineated; even the objectives to be attained are highly complex, abstract, and dependent on circumstances. Their unambiguous formulation may not be possible. For this type of problem solving, also, a "standard" solution cannot be defined. For example, in a military context, the "optimal" solution will depend on the specific, local conditions (e.g., type of organization, nature, quantity, and availability of resources) and on trade offs that cannot be precisely quantified. Solutions to such problems cannot be taught. But, concepts and considerations important to the analysis of such problems and to the synthesis of solutions can be taught. The case method is an ideal way to achieve this goal.

The case method makes it possible to deal with problems which involve complex information embedded in a realistic context. It permits the consideration not only of facts in isolation, but in relation to each other and to a host of surrounding conditions. In assessing each case, analysts are forced to deal with these relationships, to judge their relative importance, and to weigh the multiple consequences of any potential solution. This constitutes practice in dealing effectively with an entire class of problems of the given type.

In addition, during the discussion of a case by a group, the discussants stimulate each other to achieve new insights. They prompt each other, by their comments, to perceive salient problem features through each other's eyes. Often, this serves to restructure or to reorganize each discussant's own perceptions, and, ultimately, to stabilize a definition of the best or optimal way to deal with the issues.

By nature of its goals, case discussions are informal. However, they are more than casual speculations. For the present materials, there are a number of specific points that should emerge during the discussion, and each case is rooted to specific training objectives. The training objectives for each case are included with the case. Moreover, "lead questions" are provided to focus the discussion on the goals.

The Cases

There are seven cases in the Unit. All pertain to issues of soldier performance in continuous operations. The cases are ordered in a sequence which progresses from information evaluation and policy formulation (three cases) through training plan development and implementation (two cases) to combat applications (two cases). While each case can be considered quite independently of all others, administration of at least one case from each group is recommended.

An abstract of each case is presented below:

A. Information Evaluation and Policy Formulation

° Case 1: Getting Started

Content: A Division Commander in West Germany designates a group to study continuous operations and performance degradation concepts. The group reviews relevant information and prepares appropriate policy.

° Case 2: Ft. Zebra

Content: At Ft. Zebra, ARTEPs are to be specified which incorporate aspects of continuous operations combat. Emphasis is placed on performance degradation countermeasures. Command staff members are to make recommendations within their own areas of responsibility.

° Case 3: Policy Implementation and Evaluation

Content: A mechanized infantry division is to prepare for transfer to Europe in 120 days. A policy to improve soldier resource conservation during continuous operations is specified and the case raises issues regarding implementation and evaluation.

B. Training Plan Development and Implementation

° Case 4: Continuous Operations Training

Content: Policies regarding counter degradation measures as a part of continuous operations preparedness training were developed at the Division level. Problems (morale and equipment) with implementation arise and appropriate adjustments are made.

° Case 5: Ft. Xray

Content: One of two commands located at Ft. Xray is undergoing counter degradation measure training but not receiving cooperation from the second command. A realistic, 120 hour field exercise is scheduled for all personnel. Weaknesses are revealed during the exercise.

C. Combat Application

° Case 6: Imminent Attack

Content: A mechanized infantry division is transferred to Europe on short notice. The troops are deployed for a predicted breakthrough attack.

° Case 7: Continuous Combat Operations

Content: Threat forces have launched an attack. Combat has been continuous for 68 hours. After an additional 40 hours, fresh troops are incorporated into the defending forces and a counter-attack is planned.

Organization of Cases

The organization of the cases follows a consistent pattern. Each case is divided into three parts. Each part represents a self-contained, progressive stage of problem development. Following each of these parts, two (sometimes overlapping) sets of issues are sketched. The total group will be divided into halves and each half, in a "huddle session," will develop responses to one of the sets of issues. Each group will report its consensus back to the total group which will then critically discuss the solution(s).

"Lead questions" are provided that are relevant for either or both sets of issues. These questions represent salient points which have implications for the problem at hand and may be introjected into the discussion by the leader to: (1) keep the discussion on track and continually progressing toward the objectives, and (2) stimulate discussion if the discussion is lagging. The lead questions need not be used verbatim. They may be paraphrased. Many of the points included in the lead questions will emerge spontaneously during the discussion. In this case, the corresponding lead question(s) should be ignored.

Required Materials and Facilities

All the materials necessary for presenting the cases are included within the cases themselves. However, the scenario (i.e., description of conditions) for each part of each case will need to be reproduced in as many copies as there are participants in a session. Similarly, each member of each group (A and B) will need a copy of the issues which his group is

to discuss during their "huddle session."

The meeting room will need two conference type tables around which the two huddle groups can meet, as well as facilities for the group to meet as a whole. Availability of a chalk board will also be helpful.

Size

The total group size should not be greater than 18 persons. This will allow nine persons per "huddle group."

Recommended Procedure

The sequence of procedures for presenting the case materials is:

1. Plan well in advance which cases are to be presented and discussed.

2. When the group first meets, state the content of the Unit, its purposes, how the sessions will be run, and the organization of the cases. Emphasize the informal nature of the session(s). Ask the attendees to introduce themselves and to say something about their current duty assignments.

3. Introduce the first case. Use either the text below or paraphrase.

INTRODUCTION TO CASES

Earlier, information was presented about continuous operations and soldier degradation. Now, let's get down to cases. (Distribute Part I of your first case.) Part 1 of this first problem solving case is given in this handout. Read Part 1 and try to fix the key points clearly in your mind.

Next, we are going to divide the group into a right and a left half. If you are in the group to the right, you will be considering the "huddle questions" for Group A; those on the left will work with questions for Group B. (Divide the group.) Each group is to review the issues as in a staff meeting. The objective at this point is to formulate views and positions for later discussion. Someone in each group should be appointed as group leader to record the group's consensus on the various points and to report these to the total assembly.

Before you actually start, let me point out that this is a problem solving seminar. The problem area is sustaining soldier's fighting effectiveness in continuous operation. We know that certain factors must be considered in deciding what needs to be done. The earlier briefings discussed these factors. During your deliberations, be sure to consider them and how they apply to the specific case under discussion. The object here is to familiarize you with the broad spectrum of issues pertaining to soldier performance in continuous operations, and to afford you an opportunity to exchange views.

4. Distribute, to the members of each group, the appropriate huddle questions.

5. If there are no questions, let each group designate a leader and proceed to confer for about 15 minutes.

6. Call the two groups together and write each group's question(s) on the chalk board.

7. Ask the leader of Group A to present the views developed in its huddle. Then, the entire group critically evaluates the views that have been presented. Use the lead questions, as appropriate, as topics for consideration. Next, apply a parallel procedure for Group B.

8. Encourage continuing discussion. If prompts are needed, pose one of the lead questions for each case and part of it. Do not inhibit discussion that is in full swing and proceeding naturally. Occasionally suggest factors that have not been considered (e.g., use further lead questions). Terminate the discussion of the current Case or Part when appropriate. Summarize what has taken place and the principle views that have emerged.

9. Introduce the next Case or Part.

Hints for Productive Case Discussion

Your role as the case leader is to assure productive discussions which form the basis for achieving the objectives of the Unit. The following hints may be useful for assuring the quality of the discussion:

1. If the group seems reluctant to sustain discussion, rephrase some key point that has been introduced (e.g., in Group A's or B's report), and ask for elaboration relative to some key issue or training objective. Alternatively, pose a lead question. Address some one or two specific participants directly.

2. Emphasize the problem solving nature of the session. Stress that, at this time, no one has "the answers." Rather, the search is for constructive approaches to coping with the continuous operations issues, the factors to be considered therein, and their application. The Army needs to develop and evaluate many different views.

3. No matter how absurd or irrelevant it may be, never disagree with an openly stated view. Especially if that view has been stated with some vehemence, avoid the use of the negative. Instead, use the phrase "yes, but...," and bring out the objection in this way.

4. If any participant seeks to monopolize the discussion, praise his contributions, and suggest that "we want to hear what (designate a person or persons) thinks."

5. Draw out the reluctant participant by addressing some questions (perhaps a lead question) specifically to him.

6. Bring back a discussion that has drifted off by injecting a lead question, or by asking how "all this" helps to develop a continuous operations capability.

7. If you do not know the facts pertaining to a question, admit that you do not know. Never bluff. Where appropriate, you might ask why the question is essential to the point under consideration.

8. At all times, by your tone and bearing, show your own interest in the topic and your enthusiasm for exploring the best ways of developing a continuous operations capability.

Specific Objectives

The case discussions are intended to contribute to the attainment of the following learning objectives:

1. Recall those features of the major future warfare challenges having particular relevance for human performance capability and its endurance.

2. Recall conditions inherent in prospective combat environments and those generated by sustained continuous operations that operate so as to decrease (degrade) progressively the fighting performance of troops.

3. Judge the degrees and rates of performance degradation resulting from continuous operations, and the variability of degradation for different types of units, duty positions, and tasks.

4. Relate performance degradation to a range of strategic, tactical, and logistic considerations within participants' spheres of responsibility.

5. Enumerate categories of potential counter degradation measures, their characteristics, and their applicability.

6. Apply degradation and counter degradation measures information to a determination of requisite courses of prudent action, their objectives, and the needs for establishment of appropriate policy.

7. Apply degradation and counter degradation measures information, results of assessments of strategic (and other) implications, and prior determination of requisite courses of action, objectives, and policy to a formulation of appropriate policy covering all salient points and issues.

8. Review and analyze policy in terms of technical and administrative factors requiring special attention and command/management support for the effective implementation of the policy.

9. Enumerate points or issues within the policy potentially requiring coordination with agencies outside the boundaries of the immediate command authority.

Table 1 indexes each case by the command staff training objectives it is designed to meet.

Table 1

Training Objectives Met by Each Case

Case	Training Objective								
	1	2	3	4	5	6	7	8	9
1						✓	✓	✓	
2	✓	✓			✓				
3						✓		✓	✓
4					✓	✓	✓		
5			✓	✓				✓	
6	✓	✓					✓		
7			✓	✓			✓		

CASES

(Objectives: 6, 7, 8)

Case 1: Getting Started

PART 1

The time is now, and the 54th Infantry Division (Mech) is garrisoned at Xray Kaserne, Germany. Its commander has designated a task group to study the continuous operations concept, to develop its implications for the U.S. Army and, in particular, for the Division, and to present findings and recommendations to the CG and his staff. Because this assignment is viewed as a first examination, an overview of concepts and issues is desired. A report is to be presented in six weeks, but it is understood that further and more detailed studies will be ordered thereafter.

The primary mission of the Division is to counter any breakthrough attempts by a mechanized, well-trained enemy force which possesses sophisticated weaponry. As a result of a recent policy (prompted by increasing East-West tensions), the Division is required to keep one-third of its combat assets in a ready status and deployed in the field. Across the Division, personnel strength is at approximately the 78% level. Spare parts for all equipment are a problem so that, often, no more than 66% of the equipment is in an operationally ready status. While combat support maintenance is improvising a good many solutions, and is working long hours, the availability of major spare items imposes an absolute limit on availability.

In order to facilitate their work, the task group breaks itself into a set of subgroups. One subgroup is called the "soldier support subgroup." This subgroup is to formulate "human factors" recommendations.

Case 1: Getting Started

PART 1

Group A Discussion

To start their work, the "Soldier Support Subgroup" decides to approach their task as an academic exercise. Formulate an approach to the human factors analysis of the Soldier Support Subgroup. Discuss and develop the concepts and considerations which are paramount; prioritize these.

Purpose:

To recognize that the issues directly and significantly affect the mission capability of the U.S. Army, and that the human factors need to be analyzed and assessed systematically.

Key Points:

1. Warsaw Pact continuous operations doctrine
2. Warsaw Pact continuous operations capabilities
3. Inevitable decline in soldier resources for mission accomplishment
4. Lack of policy and doctrine for slowing erosion of soldier resources in combat

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Lead Questions:

What is the major evidence concerning the requirement for a continuous operations capability and what is the urgency of such a requirement?

* Soviet doctrine and capabilities
* Soviets determine character of initial battles

Is a de facto, indefinite postponement of the soldier performance decrement issue reasonable and justifiable?

* Issue needs to be clearly defined
* Possible solutions or dispositions need to be understood
* At least, contingency plans need to be developed

Case 1: Getting Started

PART 1

Group B Discussion

Some members of the "Soldier Support Subgroup" believe that there is no human factors problem. They believe that most of the units in the area have a "can do" attitude. When required, they will exert extra effort and meet the requirements of continuous operations. They argue that what is really needed is better equipment, better maintenance, and NBC training. Formulate the arguments supporting and opposing their point of view.

Purpose:

To achieve an appreciation of the fact that performance degradation in continuous operations is inevitable, and that no degree of determination to resist will effectively compensate for diminished effectiveness.

Key Points:

1. Overall, projected decline in effectiveness is serious
2. Projections are borne out by military studies
3. Slowing performance degradation requires a coherent, integrated program

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Lead Questions:

Can an effective, reliable Counter Degradation Measures (CDM) program be developed in a piecemeal fashion?

* CDMs are interdependent, not a menu
* Many CDMs must be practiced to become effective
* Training/preparation must be realistic and continuous

Case 1: Getting Started

PART 2

The "soldier support subgroup" calls in a consultant to brief it on soldier performance degradation variables and considerations. However, the briefing only serves to introduce further confusion. It has suggested problems of all sorts--training, stress control, force reconstitution, cohesion, morale, performance degradation, and so on. Now the "soldier support subgroup" is considering the implications of the briefing for its task.

Case 1: Getting Started

PART 2

Group A Discussion

Some members of the "Soldier Support Subgroup" argue that the briefing content indicates that such problems and their solutions are primarily relevant for CONUS and, especially TRADOC. The concept must be introduced, initially, in CONUS training facilities and operations. Only after its evolution and test by TRADOC can it be adapted for the 54th Division. Develop arguments supporting and opposing this point of view.

Purpose:

To recognize that continuous operations preparation is an extension of technical skills acquisition issues.

Key Points:

1. Principal requirement is acquiring skills for coping with adverse conditions
2. Training requires realistic simulation of continuous combat in adverse conditions
3. Some of training/preparation is unit specific

Lead Questions:

Is performance decrement preparedness a basic or an advanced training issue?

* Superimposed on advanced tactical and unit training

Does continuous operations training mainly try to establish new combat skills, or to expand proficiency in "old" skills under extremely adverse conditions?

* New coping skills, but essentially no new combat skills

Where is the requirement for CDM training most acute?

* In OCONUS deployed units

Is it more realistic to develop the capability from CONUS core units outward to forward deployed units, or the reverse?

* Start with forward, deployed units

Case 1: Getting Started

PART 2

Group B Discussion

Some members of the "Soldier Support Subgroup" Contend that the major problem is stress control and its effects on performance effectiveness. They think that the first emphasis should be on developing a policy in this regard. Comment on and criticize this point of view. Suggest both supporting and opposing arguments.

Purpose:

To distinguish stress from each of the other component factors producing performance degradation.

Key Points:

1. Stress is, itself, produced by many different factors
2. Performance decline is produced by many different factors; stress is only one of them
3. Effective control must deal with all producing factors

Lead Questions:

Can a patchwork policy support a genuine and effective preparation effort to achieve a soldier CDM capability?

* A coherent, integrated program must address all factors
* An effective program employs mutually interdependent CDMs

Case 1: Getting Started

PART 3

After reviewing the Division's status, resources, commitments, and prospects, along with the technical guidance regarding soldier performance degradation, the "soldier support subgroup" is ready to prepare its report. In the report, the perspectives of the individual members--in terms of expertise and current role--will be integrated. The group has come together to develop an integrated set of recommendations from the individual contributions of its various members.

Case 1: Getting Started

PART 3

Group A Discussion

Should separate reports and recommendations be prepared by different elements (e.g., armor, artillery, mechanized infantry) or is one integrated policy recommendation preferable? Why so?

Purpose:

To develop a view of the general and the specific policy requirements for developing a continuous operations capability, and to examine the required inputs from different elements.

Key Points:

1. Inevitability of some performance degradation in continuous operations
2. Different rates/degrees of performance degradation for different units/duty positions/tasks
3. Interdependency of divisional units in combat

Lead Questions:

Should command policy be directed at all units, or types of units, or could it treat units selectively? Can the policy apply progressively to various elements?

* Combat versus combat support units
* Various command levels

Is the continuous operations capability purely a ground forces problem, or are there implications for Army Aviation elements as well?

* Aviation must support around-the-clock capability

Case 1: Getting Started

PART 3

Group B Discussion

Derive, in a preliminary manner, an outline for the "Soldier Support Subgroup's" report. Does this position hold only for the present or should there be a reexamination at a later date?

Purpose:

To focus on the central, dominant issues that constitute a basic counter degradation policy, and to sort out secondary issues for later consideration.

Key Points:

1. Soviet doctrine and capabilities
2. Soviets determine character of initial battles
3. Hitherto, no U.S. continuous operations

Lead Questions:

Is it possible to develop a policy which depends on contingencies? Which contingencies?

* International situation, intelligence, alert status
* Preparation time for achieving capability

Must preparation be implemented on all levels, or can it apply to selected leadership segments only? Perhaps initially?

* No
* Capability is most critical for leadership tasks
* For Bn and higher levels CPXs can simulate

What sort of coordination problems would an intensive preparation effort entail?

* Within command elements
* Across commands in proximity
* Affected civilian community
* Soldiers' dependents/Army social support agencies

(Objectives: 1, 2, 5)

Case 2: Ft. Zebra School

PART 1

The Ft. Zebra TRADOC school is considering the incorporation of a continuous operations phase into the combat readiness training exercise ARTEPs for resident units. A group is designated to study the feasibility of implementing realistic continuous operations scenarios, especially in view of OPFORCE schedules, evaluation requirements, the uneven combat readiness status of various units, and soldier performance decrement issues. A 120 hour continuous mission is mentioned for planning purposes.

During initial meetings of the designated group, efforts are focused on identifying the factors and issues that must be considered. The insufficiency of the TRADOC school's manpower resources seems to be one issue on which the majority agrees and the group is tasked to work within this problem. The need to develop appropriate training programs, schedules, and materials is recognized. It is also acknowledged that new training exercises must be incorporated into existing training priorities and schedules. The current training priority is unit level training.

The group is concentrating its efforts on considerations of continuous operations in a European-like environment (e.g., terrain, weather, force ratios) and plans to generalize these to the present training situation. The group has determined the major feature of such combat conditions and is evaluating them against available resources at Ft. Zebra.

Case 2: Ft. Zebra School

PART 1

Group A Discussion

What are the important soldier resource conservation features of continuous combat operations that are generally important for consideration when attempting to develop "realistic" continuous operations training scenarios? Is it possible to simulate such conditions? Why so, or not so? Is the group missing any aspects of the problem? Which, if any?

Purpose:

To identify soldier resources (performance effectiveness) that diminish in combat, and to examine implications for training.

Key Points:

1. Mental (decision making, etc.) abilities degrade soonest and most
2. Leadership tasks depend most on mental abilities
3. Stress control and sleep discipline need training guidance
4. Continuous, extended FTXs approximate but are not equivalent to the continuous operations

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Lead Questions:

How are various soldier combat abilities differentially affected by continuous operations combat?

* Mental abilities degrade most and most rapidly
* Physical (motor) abilities degrade little

How necessary is it to have full exercise realism for both combat and combat support units? What are the benefits of realism? The disadvantages?

* Training must match expected combat conditions
* Produces learning to cope with conditions
* True realism overwhelms the unprepared
* Only gradually introduce the "worst" conditions

Case 2: Ft. Zebra School

PART 1

Group B Discussion

Computer projections and military studies predict soldier effectiveness degradation in continuous combat. What are the implications of anticipated quantitative and qualitative changes for training content and methods? Will increased training and support manpower be necessary? Why so?

Purpose:

To examine training implications of performance degradation in continuous operations.

Key Points:

1. Types of units, duty positions, and tasks differentially affected
2. Provide realistic conditions in training environment
3. Assess training progressively in more and more adverse conditions
4. Increased training/support manpower not needed; but a new emphasis is indicated

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Lead Questions:

Can anything positive be anticipated from a 120 hour continuous exercise for which there has been no prior preparatory training?

* Probably, no
* Soldiers discover they cannot cope

To what extent are current ARTEPs applicable to the continuous operations situation?

* Seriously adverse conditions not specified in ARTEPS

How might ARTEPS be improved to incorporate the issues arising from unreliability of soldier and unit performance during actual combat?

* Incorporate "worst" conditions in ARTEP
* Repeated observations (e.g., 2 out of 3)

Case 2: Ft. Zebra School

PART 2

The soldier performance during continuous operations group at Ft. Zebra determines the training priorities and the current state-of-readiness vis-a-vis continuous operations. The members of the group think that initial efforts should be directed at the development of increased emphasis on Counter Degradation Measures (CDMs). With the resources at their disposal, they undertake background work to formulate policy in this area.

Case 2: Ft. Zebra School

PART 2

Group A Discussion

List and discuss the benefits and the relative cost of various CDMs. Determine the prioritization of the CDMs in terms of this analysis.

Purpose:

To examine the relative trade-offs in incorporating CDM considerations into training.

Key Points:

1. Some CDMs (e.g., leadership, commitment) entail no costs and only minimal preparation
2. While some CDMs (e.g., realistic training, talent selection) entail administrative burdens and costs, the ultimate payoff could far outweigh the cost
3. For some CDMs (e.g., performance supports) benefits and/or costs are variables

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Lead Questions:

What is the time frame for implementation of various CDMs? Does it differ for each CDM? How so?

* Strategic CDMs (pre D-day) and tactical CDMs (post D-day)
* Some CDMs depend on existence of others

Crosstraining is a prerequisite for task rotation during operations. Determine which other CDMs entail prerequisite preparations and consider the implications.

* Relaxation and individual stress control practice
* Specific sleep discipline(s): planning and practice
* Performance supports and training (practice)
* Commitment, leadership, and morale/esprit

Case 2: Ft. Zebra School

PART 2

Group B Discussion

Prioritize the CDMs with regard to the abilities, skills, and tasks they serve to "protect." Comment on how this prioritization impacts on training requirements. Discuss possible differences in priority if a unit is one week away from combat versus one year.

Purpose:

To point out how the CDMs protect abilities, skills, and task performance.

Key Points:

1. Mental ability deteriorates most and needs protection most
2. Leadership tasks most dependent on mental abilities
3. Careful planning and implementation of CDMs can provide substantial benefits.

Lead Questions:

Evaluate the limits of CDMs in the present context

* Cannot overcome psychophysiological limits
* Mostly require preparation and training

How might ARTEPs incorporate CDM implementation?

* ARTEPs adjusted for projected performance degradation
* Further adjusted for CDM implementation

What policies should exist regarding the recuperation of personnel following extensive, realistic continuous operations training? Would such policies be in conflict with any existing Army policies?

* Allow rest commensurate with experienced sleep loss

Case 2: Ft. Zebra School

PART 3

The Commander of the Ft. Zebra TRADOC school receives the task group's recommendations for the incorporation of CDMs into the ongoing training of all units at the Fort. The Commander directs his staff to develop CDM policies within each staff member's own area of responsibility.

The staff officers work independently on their individual policies. Although all feel the "pinch" of manpower shortages, the mechanized infantry operations officer thinks that his units are especially taxed by the personnel shortages and the added burden imposed by this new preparation requirement.

Case 2: Ft. Zebra School

PART 3

Group A Discussion

Specify how the consequences of continuous operations combat for soldier resources and the applicability and feasibility of various potential CDMs differ for the individual areas of staff responsibility. What are the implications of these differences for effective, coordinated action of the Army as a whole?

Purpose:

To demonstrate the implications of CDM implementation for different staff responsibilities, combat arms specialties, and command levels.

Key Points:

1. CDMs represent a principal concern for G3 and similar training planners
2. CDM implementation differs for different combat arms
3. Training required not only at platoon/squad level, but also at company, battalion, and higher levels

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Lead Questions:

Considering the various areas of staff responsibility, how would differential reductions in soldier effectiveness affect the combat effectiveness of the total unit?

* Tasks requiring mental abilities degrade most
* Leadership tasks affected most

Why might an officer "rationalize" a reluctance to implement this policy?

* Failure to appreciate reality and seriousness of the requirements
* Relative priority of competing requirements misjudged

What is the necessary content for policies regarding rotation and reconstitution of units in combat?

* Extensive crosstraining within units
* Some crosstraining across combat arms units

Case 2: Ft. Zebra School

PART 3

Group B Discussion

Anticipate problems and inconsistencies that might arise among the individual staff recommendations on performance decrement prevention requirements and preparation. How can each of these inconsistencies be resolved, both internally and within overall Army policy? Why might the mechanized infantry officer's arguments be justified? Why not?

Purpose:

To point out how conflicts in requirements might be resolved.

Key Points:

1. Meeting CDM training requirements entails a coordinated set of activities
2. Realistic continuous combat training creates a need for integrated scheduling
3. For some combat arms specialties (e.g., mechanized infantry) some CDMs (e.g., selection, training) entail scenarios requiring specific OPFORCE roles

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Lead Questions:

What, if anything, can be done at this level to encourage procedural flexibility and initiative?

* Incentives for achieving continuous combat capability
* Design realistic time frames and schedules

Discuss the importance for all staff areas to develop policies fostering leadership, cohesion, and unit identity

* Leadership, cohesion, and unit identity are foundations for a successful CDM training program

(Objectives: 6, 8, 9)

Case 3: Policy Implementation and Evaluation

PART 1

Recently, international tensions have increased steadily. The U.S. has indicated that it intends to increase its forces in Europe. The 54th Infantry Division (Mech) is alerted to expect transfer to Europe in about 120 days. The 54th is directed to attain peak combat effectiveness--including the capability for sustained effectiveness in continuous operation.

The 54th is at about 80% of its authorized complement. Equipment readiness is currently "marginal." The 54th has received no training specific for continuous operations but has had considerable training in night operations. There has also been considerable emphasis on concealment and smoke screens in the recent training.

The Commander of the 54th wishes to develop a policy for Divisional performance decrement preparedness. He anticipates some reluctance on the part of various subordinate units because of the many other pressures on them at this time. Accordingly, the Commander calls a meeting of various subordinate unit leaders to describe the intent and content of the policy. The unit leaders will then be expected to implement the policy.

The Commander's first priority is to determine the 54th's current state of readiness. He directs his staff and unit leaders to assess the state of readiness and prepare reports. Counter Degradation Measures (CDMs) are to be considered in this connection.

Case 3: Policy Implementation and Evaluation

PART 1

Group A Discussion

Assume that the Commander learns that there has been no CDM preparation. The Commander believes that such preparations are necessary before the imminent deployment. Relative to other necessary preparatory efforts, how should he prioritize the CDM requirements to ensure the maximum return from preparations in the limited time available?

Purpose:

To identify CDMs promising to provide a maximum payoff in minimal available time.

Key Points:

1. Leadership, cohesion, and esprit
2. Commitment
3. Physical conditioning
4. Identifying and selecting talent
5. Sleep/ rest discipline.

Lead Questions:

As part of the initial appraisal, enumerate methods of collecting information on the current status of such stress such CDMs as leadership, group cohesion, and esprit

* Reports from/review with unit leadership
* Interviews with sample of soldiers

What methods currently exist for the selection of special talents as called for by the continuous operations battlefield?

* Soldier competition in selected tasks and situations
* Systematic peer and supervisor task oriented performance ratings

Case 3: Policy Implementation and Evaluation

PART 1

Group B Discussion

What are the most important issues that the Commander should know concerning performance decrement preparedness? How should his unit leaders obtain the information? In assessing the capacity of the personnel of the 54th for sustained operations, should the Commander assume a broad implementation of training, looking for common elements between the requirements of CDMs and the types of training his troops have already had, or should he interpret the present training background more narrowly?

Purpose:

To provide insight into the major or critical issues and to formulate approaches to their analysis.

Key Points:

1. Need for systematic, objective evaluation
2. Performance degradation rates, degrees, and variability
3. Available CDMs
4. Requirements of program for implementing CDMs and time frame

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Lead Questions:

To what extent can the Commander assume that his unit leaders are aware of the special demands that continuous operations place on soldiers? What are the implications of this for the Commander?

* Can't assume, inform subordinates about continuous operations effects

How much background information about the continuous operations concept do the various unit leaders need in order that they may assess fully their unit's preparedness? Would special briefings be necessary for the unit leaders?

* Leadership must be acquainted with key degradation issues as they pertain to their level of concern
* Probably "yes"

The training already received by different units (artillery, armor, Fist, etc.) may have prepared them differentially for the stresses of continuous operations. How could this be assessed?

* Meet ARTEPS under progressively more adverse conditions

Case 3. Policy Implementation and Evaluation

PART 2

The Commander receives from his subordinates reports on their units' current state of readiness for continuous operations. He learns that other than "marginal" within unit cross-training, his troops have completed no CDM preparation. He also learns about other weaknesses. The operations officer and the logistics officer inform the Commander that, due to the 54th's reduced complement, the ability to complete various standard operational procedures is reduced. These officers are reluctant to institute new training requirements when they believe that they don't have some of the "basics" covered.

The Commander reminds his officers of the limited time remaining before deployment and of the severe stresses placed on troops during continuous operations combat. He directs his officers to prioritize CDM training in relation to other requirements for inclusion in the regular training routine. He further directs them to consider CDM training for both officers and enlisted personnel.

Case 3. Policy Implementation and Evaluation

PART 2

Group A Discussion

What content should be included in the various policies in regard to continuous operations soldier resources conservation? Is any current doctrine or policy in conflict with your recommendations? If so, how can the conflict be resolved?

Purpose:

To recognize key elements needed for inclusion in the formulation of an appropriate CDM policy.

Key Points:

1. Requirement for maintenance of performance effectiveness under adverse conditions and for extended periods
2. Repetitive evaluation of progress toward targeted capability
3. Resolve "conflicts" in favor of continuous operations requirements

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Lead Questions:

To what extent should the policy specify prolonged-effectiveness-of-performance objectives?

* Cornerstone of policy

What consideration should be given to "critical" mission profiles and task categories?

* Highest training/preparation priority

Should performance targets be specified in terms of "acceptable" levels in critical continuous operations mission-task categories?

* Only if related to some scale of elapsed mission time and severity of adverse conditions present

How might the policy emphasize flexibility and initiative in achieving accurate, speedy, and reliable performance in critical mission-task categories?

* Rewards for progress rather than zero defects

Case 3. Policy Implementation and Evaluation

PART 2

Group B Discusssion

What special training and considerations should officers and staff receive to prepare them for continuous operations? How might the policy encourage procedural flexibility and initiative? What are the special responsibilities of officers and staff for fostering leadership, cohesion, and unit identity?

Purpose:

To provide perspective on the special leadership requirements, responsibilities, knowledges, and skills required for continuous operations.

Key Points:

1. Leadership (e.g., Command & Control) activity most severely impacted by adverse factors in continuous operations
2. CDMs benefit all levels of leadership (including Command & Staff)
3. Resource management, including self-management, especially important for preserving effectiveness of higher leadership level
4. Need for flexibility; change in leadership style

Lead Questions:

How important is it that policy specify that conditions and patterns of training must match, as nearly as possible, the worst expected combat conditions? The benefits of this?

* All must learn to cope with/compensate for adverse factors to maintain combat effectiveness
* "Worst" conditions prepare for all others

What might the policy consider in regard to individual preparation, especially with respect to stress control and coping capability, and including every level of leadership?

* Mission capability ultimately depends on individual ability to endure and to keep performing effectively
* Stress coping techniques

Case 3. Policy Implementation and Evaluation

PART 3

The continuous operations preparation policies have now been formulated and implemented divisionwide. Perhaps because of the acknowledged threat in Europe, compliance with the policy has been wholehearted and thorough. Although a few problems remain, the Commander is pleased with the progress his units are making towards resistance to performance decrement.

The Commander believes that an accurate evaluation of the various stress coping techniques and CDMs that have been incorporated into the training regimen is necessary for strategic and tactical planning considerations. Therefore, his concern now centers on evaluation.

Case 3. Policy Implementation and Evaluation

PART 3

Group A Discussion

The Commander has directed that the policies be implemented. How can progress towards goals be monitored? What should be checked and what standards invoked? What problems can be anticipated at this juncture, and how can they be met? Are problems different for officers than for enlisted personnel?

Purpose:

To realize the problems of assessing compliance with CDM policy and progress toward its fulfillment.

Key Points:

1. Evaluation must be objective and relative to severity of imposed conditions
2. Stress reduction training is individual, personal, and success can only be approximately measured in training
3. Success must be assessed relative to tasks and mission goals
4. Continuous CPXs, suitable training for senior command and staff personnel
5. Formal inventory of progress vis-a-vis each CDM
6. Continuous FTX performance of subordinate units must show trend of improvement
7. Permit flexibility to revise, refine, and improvise so as to achieve a genuine continuous combat capability

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Lead Question:

Describe how ARTEP standards can be used to evaluate incremental performance under these circumstances

* Degree to which ARTEP standards are maintained under more and more adverse conditions

How are depth of crosstraining, rotation of units, and function of reconstituted units (elements) important to judging progress towards goals?

* Flexibility of mission/soldier resources

To what extent should progress be evaluated in terms of individual or unit progress towards goals? What are the advantages/disadvantages of each?

* Progress rather than zero defects is what counts
* Significant CDM benefits develop only gradually

Case 3. Policy Implementation and Evaluation

PART 3

Group B Discussion

Now that the continuous operations policy is being implemented, what other coordination might be required? Consider, also, any necessary social support for soldiers' dependents.

Purpose:

To direct attention to various coordination requirements likely to be generated by a continuous operations preparation policy.

Key Points:

1. Coordination within the command; across nearby commands
2. Coordination regarding training facilities
3. Coordination with affected civilian authorities
4. Coordination for social support of soldiers and their dependents

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Lead Questions:

How might the evaluation plan explicitly consider the training and preparation impact on soldier morale and their dependents?

* Determine problems due to demanding training
* Alleviate to reduce distractions from training

(Objectives: 5, 6, 7)

Case 4: Continuous Operations Training

PART 1

The 54th Infantry Division (Mech) recently and suddenly published a new policy to prepare the division for a continuous operations capability. The division is at about 75% strength. It is experiencing considerable problems in obtaining spare parts for much of its equipment. In consequence, all of its maintenance resources, including personnel, are hard pressed to support tactical training operations with operable equipment. Additionally, a policy designed to develop a desert operations capability was imposed recently and is straining subordinate units' resources and capabilities.

The new continuous operations policy has met with protests from subordinate commanders and staffs. Indications are that compliance with the policy is marginal, and just enough to satisfy its letter, but not its spirit. "Informal channels" suggest that personnel at all levels are bad-mouthing the policy and its requirements. Enlisted personnel are especially critical of the increased physical conditioning and crosstraining requirements. Maintenance staff personnel state that unrealistic demands are being placed on them.

The Commander wishes to attain continuous operations readiness but believes he may need to scale back on his original policies and time tables. He undertakes to determine the key elements of performance decrement during continuous operations and to start CDM training as soon as reasonably possible.

Case 4. Continuous Operations Training

PART 1

Group A Discussion

Should the Commander modify his policy, or should he order his units to "exert more effort"? How might policy be altered to prevent the overtaxing of personnel and equipment resources? For example, in the case described here, what CDMs could be developed that do not rely on the availability of equipment?

Purpose:

To allow examination of the possibilities for flexibility in CDM policy implementation.

Key Points:

1. CDMs such as leadership, commitment, physical conditioning, and stress reduction require minimal "extra" effort and no equipment
2. Detailed planning can be developed for other CDMs
3. Detailed full scale training plans can be tied to specified contingencies (e.g., more resources, international situation)
4. At least an appreciation of continuous operations problems can be developed in small scale/infrequent continuous exercises
5. The current situation of "overwork" is much less severe than that which will be encountered during continuous operations. Some of the CDM training might be incorporated immediately into the current situation

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Lead Questions:

In what way might social support agencies be helpful to reduce the strains of soldier CDM training?

* Substitute somewhat for soldier's role in family
* Ease soldiers' family obligations

How might policies concerning procedural flexibility ease the burden of the performance maintenance requirement?

* Permit "shortcuts" to achieving essential mission objectives

Case 4. Continuous Operations Training

PART 1

Group B Discussion

Is it possible that this is a morale/leadership/commitment problem rather than an "overwork" problem? If so, what steps should have been taken within the Division before the introduction of the new training requirements? Why is each step that you suggest important?

Purpose:

To provide awareness of the importance of securing a general commitment to CDM policy if it is to become effective.

Key Points:

1. All soldiers in a unit must share the commitment to achieve a continuous combat capability
2. All personnel must be indoctrinated and become convinced of the necessity for making extraordinary efforts

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Lead Questions:

The case makes reference to "informal channels." Do consistencies or inconsistencies among "formal" or "informal" channels of information have any special implications vis-a-vis the present situation?

* Informal channels more reliable for information discordant with policy?
* Information permits assessment of degree of existing commitment to policy

Case 4. Continuous Operations Training

PART 2

The unit commanders and staff officers favorably receive the new timetables for CDM preparation. Although the timetables have been revised, attainment of performance decrement minimization remains a high priority. However, maintenance demands remain strained. This has severely hampered the Division's desert operations training with armored equipment. Also, the entire concept of continuous operations and its attendant training requirements are not well received by enlisted personnel. They appear to be "just going through the motions" of the training exercises.

The Commander is faced with the necessity of changing the uncooperative attitude of enlisted personnel and some junior officers. At a meeting with his staff and assistant division commanders, the Commander outlines the problems and asks for recommendations.

Case 4. Continuous Operations Training

PART 2

Group A Discussion

Can a determined "hard sell" effort change attitudes? Will a thorough dissemination to all levels of expected continuous operations conditions and their consequences constitute a workable solution? Why or why not?

Purpose:

To provide an opportunity for examining alternative approaches to changing uncooperative attitudes about CDM training.

Key Points:

1. Resistance to "hard sell"
2. Disbelief of the seriousness of the consequences from continuous operations under the "worst" conditions
3. Belief in own ability to "tough it out"
4. Provide indoctrination on conditions of continuous operations and emphasize advantages to individuals of such training

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Lead Questions:

What preparatory indoctrination, if any, should be given to units before introducing a policy such as that involved here?

* Soviet doctrine and capabilities
* Full information about effects of adverse factors
* Ability of CDMs to retard performance degradation

Case 4. Continuous Operations Training

PART 2

Group B Discussion

Might the best way to change reluctant cooperation be to let personnel experience the conditions with which they will have to cope? Therefore, should a continuous FTX be scheduled with very little warning? What problems might be raised by such an action?

Purpose:

To develop an appreciation of the need for preparation before engaging in continuous operations.

Key Points:

1. Moderate simulation, with safeguards, may serve to convince
2. Coping with adverse factors in continuous operations must be learned; the ability does not exist at beginning of training
3. Encountering continuous operations conditions when still unprepared may traumatize participants and convince soldiers that there is no hope

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Lead Questions:

Should the Commander now exempt female soldiers from his policy? Justify your answer.

* Training is most essential for combat personnel
* Training is also important for combat support personnel
* Training is desirable, but not essential for combat service support personnel

In what ways might CDM training necessitate changes in standard training schedules?

* Recovery time required after continuous exercises

What incentives could be developed for active participation in CDM training?

* Unit competition and overt recognition
* Special off-time during recovery period, or even beyond

Case 4. Continuous Operations Training

PART 3

The 54th is now two months into its new continuous operations training. Compliance with the policy is greatly increased as a result of a series of informational and unit recognition techniques, and through increasing experience with continuous FTXs. The severity of the maintenance problems is reduced as the result of an increased emphasis on crosstraining in the maintenance area.

The improvements in the 54th's morale and combat readiness are nothing short of remarkable. A "Special Group on Performance Decrement" from Corps headquarters visits the 54th to document these improvements and to determine which policies should be implemented throughout the Command.

Case 4. Continuous Operations Training

PART 3

Group A Discussion

What criteria should be used to determine a Command's CDM capability? How might these criteria differ both within a Command (e.g., a division) and between Commands?

Purpose:

To examine the varied, appropriate criteria for assessing continuous operations readiness, and the factors that determine them.

Key Points:

1. Proportions of types of units (e.g., infantry, armor) comprising the command
2. Expected critical missions, mission profiles, and their critical segments

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Lead Questions:

How might a policy regarding procedural flexibility be formulated and assessed?

* Performance, not procedure, is what counts (the criterion)
* Different time frames for different units
* Many CDMs (e.g., sleep discipline, performance supports) are unit or even task specific

Case 4. Continuous Operations Training

PART 3

Group B Discussion

How might performance degradation minimization policies differ for various types of units within a division. What special considerations does this impose on assessing policy compliance and command consistency?

Purpose:

To examine differences in continuous operations performance requirements and need for recognition of these differences in policy.

Key Points:

1. Tasks of combat unit types
2. Tasks of combat support unit types
3. Tasks of combat service support unit types

Lead Questions:

How might recognition of individual units' achievements be used to encourage cooperation with CDM training policies?

* Promote competition among units
* Provide rewards for high achievement

What policies may be required for elements of CDM preparedness that go beyond divisional boundaries?

* Coordination to assure uniform capability for maintaining performance across commands
* Forestall discontent due to unequal demands on personnel in nearby commands

How could/should current ARTEPs be altered to reflect the requirements of continuous operations?

* Adjust ARTEPs for surrounding conditions of performance

(Objectives: 3, 4, 8)

Case 5: Ft. Xray

PART 1

Presently colocated at Ft. Xray with the 54th Infantry Division (Mech) is the 27th FA BDE. The 54th has implemented a strong CDM program to prepare the division for continuous operations in anticipation of a transfer to Europe. Normally, the 27th FA BDE has provided GS fire in tactical exercises conducted by the 54th.

On post, personnel of the 54th Infantry Division and the 27th FA BDE mingle freely. Discrepancies in duty demands on 54th personnel as opposed to others have been widely discussed. Also, a reluctance is in evidence by the 27th FA BDE to participate in the 54th's tactical continuous operations exercises to the extent desirable.

Case 5: Ft. Xray

PART 1

Group A Discussion

How necessary is it for the 54th in evaluating its progress toward attaining its CDM goals to work with a FA unit which has instituted a similar policy? Can a CDM program be expected to be useful if only part of a total force has such preparation?

Purpose:

To examine personnel (social) and organizational issues that can arise in policy implementation.

Key Points:

1. Continuous FTXs are reasonable only when participating units have a similar degree of capability
2. Imbalance in abilities to maintain performance is likely to disrupt training and may even be dangerous

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Lead Questions:

Considering the performance decrement context, enumerate the obstacles to cooperation among separate commands such as those described.

* Unreliability of support from less well-trained unit(s)
* Inability of untrained unit(s) to endure until final period of exercise/mission

Does any current situation either hinder or facilitate the types of coordination among Commands that is necessary during CDM training?

* Nonuniformity due to individual policies

Case 5: Ft. Xray

PART 1

Group B Discussion

Coordination among separate units is a necessary element of any successful program. In this case, how could the CDM plans of the Commands be more effectively coordinated? What would be the expected benefits resulting from such cooperation?

Purpose:

To demonstrate the necessities for coordination and cooperation among Commands when developing a continuous operations capability.

Key Points:

1. Coordination of schedules or timing
2. Cooperation in training and simulated continuous combat exercises

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Lead Questions:

In what ways might the performance degradation resulting from continuous combat create unexpected problems in Command coordination?

* Uneven performance of cooperating units/commands
* Decrement will be different for different unit types

Is it possible that preparations for performance decrement during continuous operations might differ for armor, artillery, and infantry groups?

* Performance decrement depends on activity (tasks)
* Different activities degrade at different rates

From the point of view of CDM preparedness, devise methods of improving the level of cooperation between the two Commands mentioned

* Coordinate policies
* Cooperative training/preparation

Case 5: Ft. Xray

PART 2

Although CDM preparation has not been undertaken by both Commands, the two Commands at Ft. Xray are directed to conduct field exer- cises simulating action of extended duration. The Commanders agree to a 120 hour continuous exercise. The 23rd Armored Division will also parti- cipate in the exercise. The 23rd has had no performance degradation countermeasure training. The Commanders of the 23rd and the 27th believe that their units will "hack it" because the units have "can do/will do" attitudes.

Three purposes of the exercise are: (1) to provide realistic combat training, (2) to assess the CDM program of the 54th, and (3) to practice coordination activities among Commands.

Case 5: Ft. Xray

PART 2

Group A Discussion

This is a case of soldiers going into a continuous operations exercise with little preparation specific to continuous operations. To what extent will "standard" Army training prepare soldiers for the new demands of continuous operations? Can you anticipate any problems which might emerge during the exercise and what can be done about them?

Purpose:

To define the differences between conventional tactical types of training and continuous operations training.

Key Points:

1. Soldiers have not learned to cope with adverse factors
2. Unprepared units likely to be "traumatized" by severity of experience

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Lead Questions:

What do the results of various military studies on extended operations lead one to expect vis-a-vis degraded performance effectiveness during the course of the exercise?

* Progressive decline of effectiveness
* Increasing variability (unreliability) of performance

Which tasks will be most vulnerable to the effects of sleep loss and stress? How will this impact on the success of various missions?

* Mental tasks (decision making, etc.) degrade first/most

Case 5: Ft. Xray

PART 2

Group B Discussion

A number of "quick fix" CDMs will need to be implemented during the exercise by the artillery and the armored units. Given their current CDM preparedness status, what are they? How successful will they be? Why so?

Purpose:

To examine the nature of the on-the-spot decisions for implementing CDMs in units which are untrained in CDMs.

Key Points:

1. Task restructuring and rotation (as feasible)
2. Sleep/rest discipline
3. Resource management

Lead Questions:

What methods are available or need to be developed to assess the effectiveness of CDMs?

* Compare before/after CDM implementation effectiveness
* Compare with performance of unprepared units
* Performance records over exercise/mission

Case 5: Ft. Xray

PART 3

The continuous operations field exercise is in its 100th hour. The Commanders are frequently surprised during the exercise. In general, the artillery and armored performance is poor--especially in regard to maneuverability. The artillery and the armored Commanders are greatly concerned about the ability of their troops to persist in the operation at the required level of maneuverability and to react to changes in the situation such as capitalizing on successes. The commanding officers and staff feel greatly stressed themselves. The members of the 27th FA BDE appear to be noticeably less affected by the operations than members of the armored group.

The unit Commanders decide to continue the operation for the full 120 hours. A number of items are identified as deficiencies for inclusion in the postexercise debriefings.

Case 5: Ft. Xray

PART 3

Group A Discussion

Performance degradation during continuous operations will occur at different rates for different tasks and different units. What are the implications of this for matters such as strategic and tactical policy which emphasizes maneuverability? Discuss how tactics may need to be changed during the course of continuous operations as a result of shrinking soldier resources.

Purpose:

To provide experience in adapting plans and operations to available soldier resources (degraded performance capability).

Key Points:

1. Judgment and decision making ability of subordinate commanders will become unreliable
2. Ability to coordinate tactics and maneuvers will become limited

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Lead Questions:

What CDMs are available to troops not specifically trained for continuous operations?

* Task restructuring/rotation
* Sleep/rest management
* Resource management

How can leaders anticipate the reduced effectiveness of their troops and develop plans to make best use of whatever resources are available?

* Base plans on best available projections of effectiveness after given mission duration

What strategic and tactical issues arise from unreliability of mission performance and accomplishment?

* Estimate probabilities of mission success/failure
* Plan back-up resources to accomplish mission

Case 5: Ft. Xray

PART 3

Group B Discussion

Thinking, problem solving, and reacting to altered situations are among the abilities most degraded by stress and lack of sleep. Consider them in relation to the postexercises debriefing. Consider the importance of CDMs for officers. What types of performance support techniques are available for officers?

Purpose:

To examine effects of continuous operations on "mental" tasks and the performance supports for leadership activities.

Key Points:

1. Degradation of "mental" task performance cannot be held off voluntarily (by determination)
2. The lesson of mistakes made is a need to learn to cope with and compensate for adverse conditions, not that basic decision making skills need improvement
3. Consider: crosschecking, task rotation, sleep discipline
4. Predetermine major mission profiles, and develop "checklists" for general solution features

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Lead Questions:

Formulate a policy regarding sleep, rest, and recuperation discipline following an exercise such as that described. How would this be altered by the demands of actual conflict?

* Recuperation (off-duty) in keeping with sleep loss (per established guidelines)
* Rotate units as best possible

(Objectives: 1, 2, 7)

Case 6: Imminent Attack

PART 1

Although such a move was anticipated, the 54th Infantry Division (Mech) is airlifted from CONUS to Europe with less than two days warning. Its heavy weapons and equipment are left behind in this move and are to be replaced from European POMCUS stocks. On its departure from CONUS, the Division is about 80% of authorized strength. The Division is advised that it will be brought up to full strength from casual elements in Europe. The sudden advance in the time for the shift is part of a response to a rapid increase in international tensions. The move is begun at 011500 July and completed at 031000 July. On arrival, the Division's command and staff are briefed most specifically on the defense of an area assigned to it. The Division's units are deployed in this area as rapidly as possible after being reequipped and receiving new personnel. Reequipping furnishes the Division with only about 70% of its authorized heavy weapons and equipment, although more weapons and equipment are promised.

Case 6: Imminent Attack

PART 1

Group A Discussion

What CDM considerations seem appropriate now? Prioritize these and discuss them in relationship to other pressing issues.

Purpose:

To emphasize CDMs appropriate before and after airlift to an overseas area in which hostilities are threatening.

Key Points:

1. Adaptation to new time zone
2. Work/rest schedules
3. Aspects of sleep discipline

Lead Questions:

How should policy recognize the recency of eastward transmeridianal relocation?

* Adopt schedule of new time zone immediately
* Rest and sleep during flight
* Work immediately on arrival

Which facet(s) of work/sleep/rest discipline should be emphasized at this stage?

* Work/rest schedules

Case 6: Imminent Attack

PART 1

Group B Discussion

Assume that the new personnel have not received the same CDM training as the personnel of the 54th. What CDM training policy is required for the new personnel? Considering the differences between the new personnel and the personnel of the 54th in CDM preparedness, should the new personnel be distributed on an "as required" basis throughout the 54th, or should they be formed into units and the units integrated into the 54th? Consider the implications for total unit effectiveness.

Purpose:

To emphasize the CDM related requirements for integrating new personnel into established units and some resulting options.

Key Points:

1. New personnel must be (socially) integrated into established units and their organization
2. New personnel are "unknown quantities" to old personnel, and vice versa
3. New personnel have not been trained for a continuous operations capability; they are deficient in coping ability
4. Cohesiveness and team function probably best served by forming units of new personnel; however, the opportunity for peer (cross) training is lost

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Lead Questions:

Should new personnel be integrated into a unit staffed with long term assignees?

* Depends on time available for integration

In what way(s) can confidence in leadership be developed in newly assigned personnel?

* Displays of authoritative leadership
* Demonstrations of competence

Do crosstraining and its techniques have any relevance under the described conditions?

* Soldier-to-soldier instruction effective for technical skills/knowledges, for some CDM indoctrination, and for integrating new personnel

Case 6: Imminent Attack

PART 2

Intelligence advisories continue to arrive, and they continue to suggest the advent of hostilities. Opposing forces have been reinforced and deployed in tactically advantageous positions. As a result, the various elements of the 54th Infantry Division (Mech) occupy and strengthen a number of battle positions (BPs).

Case 6: Imminent Attack

PART 2

Group A Discussion

What is the most advisable policy for the 54th to implement now considering the needs to: (1) prepare the strongest possible battle positions, (2) prepare for all tactical contingencies, and (3) allow the troops to enter battle in the most rested state possible?

Purpose:

To examine the factors in the dilemma between work (stronger BPs) and rest (prolongation of effective performance).

Key Points:

1. Specific situational factors are the deciding ones
2. Specific situational factors are complex and unpredictable
3. Relation of recency of sleep to battle endurance must not be underestimated

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Lead Questions:

Which facet(s) of work/sleep/rest discipline should be emphasized at this stage for lower ranks and enlisted personnel?

* Work/rest schedules
* Task rotation

How much of the information in the intelligence advisories should be passed on down?

* All security-free aspects

What further measures should be taken to affirm leadership, cement esprit, and renew commitment?

* Maintain frequent personal or communications contact
* Appeal to esprit and commitment

Under the momentary circumstances, what might be the proper balance between preparation (work) and rest?

* Assure, at least, 8 hours sleep per 24 hour day

Case 6 : Imminent Attack

PART 2

Group B Discussion

What type of sleep discipline is necessary for officers at this juncture? In what way, if any, should this discipline differ from that of other personnel? Discuss the "pros and cons" of a special sleep discipline for persons in key commmand positions.

Purpose:

To advise about the special requirements for sleep imposed by significant thinking and decision making (mental task) responsibilities.

Key Points:

1. Thinking capability deteriorates most (and soonest)
2. Thinking capability must be protected
3. Clearheaded decisions are vital to mission accomplishment and unit survival

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Lead Questions:

Is it wise or unwise, at this stage, for unit Commanders to supervise personally all preparations? Why so?

* Commanders must preserve themselves for decision making
* Delegate responsibilities, and rotate staff

Case 6: Imminent Attack

PART 3

At 052300 July, the 54th Infantry Division (Mech) is advised urgently and confidentially to expect an aggressor breakthrough attack within 48 hours. Intelligence estimates that this attack is to be mounted by the 19th Combined Arms Army, elements of which are identified opposite the 54th Infantry Division (Mech). This is the first unequivocal advisory that hostilities are about to erupt.

Since no relief and resupply are foreseen for at least five days, the 54th Infantry Division (Mech) must sustain continuous operations over this period with existing resources.

Case 6: Imminent Attack

PART 3

Group A Discussion

Taking an extremely optimistic view of prospects for relief and resupply, formulate a divisional policy designed to assure a maximal fighting effectiveness.

Purpose:

To examine methods for exploiting CDM capabilities established in training for implementing the appropriate set of CDMs in the prospect of immediate continuous operations.

Key Points:

1. Ideally, troops should wake as the battle begins
2. Continue CDM indoctrination for new personnel
3. Demonstrate leadership, commitment, and esprit
4. Implement all CDM related SOPs (e.g., passing information) previously developed
5. Plan for unit rotation

Lead Questions:

At this stage, what might be the proper balance between preparation (work) and rest?

* Balance heavily weighted in favor of rest/sleep

Which fact(s) of work/sleep/rest discipline should be emphasized at this stage for lower ranks and enlisted personnel? How will the recent eastward dislocation modify normal work/sleep/rest discipline?

* Limit duty (work) to essentials only
* Practice relaxation, and sleep as much as possible
* Match waking time to "new" time zone

What sort of work/rest/sleep discipline should be implemented at command levels?

* Devote waking time to making plans and decisions
* Delegate execution on a rotating basis
* Practice relaxation, and sleep as much as possible

Case 6: Imminent Attack

PART 3

Group B Discussion

Devise a "checklist" which can be employed at divisional level for a last minute check that all soldier CDMs are in place.

Purpose:

To review plans for integrated CDM implementation in actual combat.

Key Points:

1. Assert leadership, and exploit commitment and esprit
2. Implement full scale sleep/rest discipline
3. Implement stress reduction (management) techniques
4. Ready task restructuring and rotation plans
5. Plan soldier resource management

Lead Questions:

What sort of work/sleep/rest discipline should be practiced by combat support elements?

* Work/rest schedules
* Task rotation

Which soldier resource management issues deserve consideration at this stage?

* Assign special combat roles
* Recognize diminishing performance capability in planning future operations
* Rotation and fair distribution of combat burdens

(Objectives: 3, 4, 7)

Case 7: Continuous Combat Operations

PART 1

It is 0430 h and 68 hours since aggressor forces hsve launched their first breakthrough attack. All U.S. forces in Europe have been in continuous combat during this time. The 54th Infantry Division (Mech) sustains heavy losses in relentless echeloned attacks against it. Southeast of the 54th, the 16th Armored Division is largely shattered under these attacks. Now, the I U.S. Corps orders the remnants of the 16th Armored Division. to integrate with the 54th Infantry Division (Mech). Also, the reconstituted 54th is ordered to fall back, regroup, and maintain a new defense line.

Because of the ferocity of the fighting and the extreme damage to equipment, maintenance is working unceasingly, but is not keeping up with service requests. In consequence there is a substantial number of tracked vehicles (IFVs, tanks, howitzers) with reduced capabilities. Enemy electronic jamming is heavy, and communication of intelligence information is fragmentary. Approximately 40% of the 54th's personnel are lost.

Elements of the aggressor's 96th Tank Division succeed in penetrating south of the 54th, and must be displaced or neutralized to accomplish the assigned mission. The Commander of the 54th is ordered to defend both its front and flank. He is concerned about his losses, the confusion of the battle, and the diminished effectiveness of his troops. Other than the troops from the 16th Armored Division, the Commander knows that he cannot expect reinforcements or replacements for at least 96 hours. The Commander assembles his staff and unit leaders to give his orders. He also reminds his officers of ways of forestalling their units' shrinking soldier resources.

Case 7: Continuous Combat Operations

PART 1

Group A Discussion

Assume the troops of the 54th are extensively prepared for continuous operations. Given this preparation, what aspects of their performance can be expected to degrade most rapidly under combat conditions? Which aspects can be expected to degrade least rapidly? What are the implications of declining performance effectiveness for tactical deployment?

Purpose:

To examine qualitative and quantitative aspects of performance degradation and their implications.

Key Points:

1. Mental performance degrades first and most
2. Physical activity degrades least
3. Vigilance, recognition (e.g., of changing conditions), and the like becomes unreliable (variable)
4. CDMs only retard progressive degradation

Lead Questions:

How could the degree of retained combat effectiveness be estimated?

* Consult existing projections for elapsed time of continuous combat
* Implement PERFECT, if feasible
* Allow for benefits of CDM training and implementation

What factors in the operations (as described) are likely to be most detrimental to soldier performance?

* Sleep loss
* Stress from confusion, uncertainty, and intensity of combat

Case 7: Continuous Combat Operations

PART 1

Group B Discussion

Considering: (1) the personnel level of the 54th, (2) the unknown condition of the personnel from the 16th, and (3) the time on continuous battle of the 54th, what suggestions might the Commander make vis-a-vis maintaining performance effectiveness?

Purpose:

To demonstrate potential issues of extreme complexity and constraints of highly adverse circumstances in continuous combat.

Key Points:

1. Strongly emphasize leadership and commitment.
2. Maintain established, integral unit identities as much as possible.
3. Pass on only "encouraging" information; offer hope.
4. Emphasize soldier resource management.

Lead Questions:

How would the various units benefit from early implementation of sleep/rest discipline?

* Unquestioned benefits, but feasibility questionable

What problems might arise from the conbining of units that have not trained together, as described in the case?

* Reciprocal lack of confidence in "strangers"
* Differences in coordination/cooperation (tactical maneuvering)
* Uneven levels of performance (units, individuals) due to differences in CDM training

Case 7: Continuous Combat Operations

PART 2

Twenty hours pass (a total of 88 hours of continuous combat). Although suffering heavy personnel and equipment losses, the 54th denies the aggressor any advances. The aggressor attacks continue although at a lowered intensity. TACAIR strikes are especially effective. The 54th loses an additional 10% of its personnel. With the inclusion of the few remaining elements of the 16th Armored Division, the 54th stands at approximately 60% of its initial strength (40% original personnel, 20% personnel from the 16th).

Reinforcements are being flown from CONUS to Europe. The Commander of the 54th is advised that fresh troops in sufficient numbers to bring the Division to full strength will arrive within 24 hours. In the meantime, he is ordered to hold his assigned defensive sector with the combined elements of the 54th and the remnants of the 16th Armored. He is attempting to assess the Division's true capabilities against demands arising from likely tactical moves by the enemy.

Case 7: Continuous Combat Operations

PART 2

Group A Discussion

Over the next 24 hours, and in view of the prospect for receiving replacements from CONUS, would it be advisable to retain original unit (battalions, companies) identities for the 54th and 16th (although each is extremely understrength) or should personnel be integrated at the company, platoon, and squad levels?

Purpose:

To review options and the factors governing choices in reconstituting units decimated and degraded in continuous operations.

Key Points:

1. Unit cohesion and esprit are important factors that sustain soldiers' fighting spirit
2. Established units (squads through battalions) have established effective modes of coordinated operation over time; integrating at platoon and squad level mixes "strangers."
3. Personnel from both original units (54th and 16th) are likely to be suffering high degrees of performance degradation
4. If units are kept intact, all will be extremely understrength and with soldiers' performance capabilities highly degraded

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Lead Questions:

How important is unit identity likely to be for esprit of troops at this stage?

* Very possibly a critical sustaining factor

How might team performance be affected, at this stage, by the introduction of new soldiers?

* "New" soldiers are "strangers"
* Teams will not be practiced in coordinated operation

In view of expected unreliability of mission performance, does a policy of units overwatching each other have merit?

* Task reallocation, sharing, and replication are applicable to teams/units as well as individual soldiers

Case 7: Continuous Combat Operations

PART 2

Group B Discussion

What are the likely true capabilities of the reconstituted 54th? What reliance can be placed on the successful accomplishment of an assigned mission by any component unit? How should these factors enter into tactical planning for the next 24 hours?

Purpose:

To provide experience in estimating likely shrinkages of soldier resources in continuous operations, and in assessing remaining mission capabilities.

Key Points:

1. At best, performance capability of remaining personnel (from 54th or 16th) will be marginal
2. Leadership, at all levels, is likely to perform its tasks (especially "mental" tasks) only marginally
3. Ability to plan effectively and reliably and to execute even moderately complex missions is now questionable

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Lead Questions:

Is there a likely difference in reaction capabilities to a brief attack as opposed to a massive, prolonged one?

* Each individual soldier may be able to muster resources and perform somewhat effectively for a brief period
* In prolonged fighting, soldiers' remaining "personal" resources are likely to become exhausted

How should the information regarding prospective reinforcements be handled?

* Pass information on down as quickly as possible
* Consider phrasing; what if reinforcements are late, etc.

Case 7: Continuous Combat Operations

PART 3

After a further 20 hours (a total of 108 hours of continuous combat) fresh reinforcements, flown in from CONUS, arrive. They are elements from a CONUS division that was formed only about two months ago, and they bring the Division up to 90% of authorized strength (40% original personnel, 20% personnel from the 16th, 30% new personnel). The unit training of the new personnel was not complete, and their CDM preparation was rudimentary. Since debarking from their transatlantic flight, they have been continuously on the move to join the 54th.

Opposite the 54th, the enemy seems to be slowed by logistics problems, and this helped the 54th to hold over the preceding 20 hours. Now, however, it appears that renewed determined attacks can be expected. Again, the Division's Commander is seeking to improve his capabilities for meeting the prospective demands.

Case 7: Continuous Combat Operations

PART 3

Group A Discussion

What divisional reconstitution and replacement policy should be recommended now? Explain the considerations influencing your recommendations.

Purpose:

To provide additional practice in analyzing options and the factors governing choices in reconstituting degraded units

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Key Points:

1. CONUS reinforcements' tactical training not complete
2. At best, CONUS reinforcements have rudimentary continuous operations capability
3. "Jet lag" and time since disembarking make reinforcements less than completely rested
4. CONUS and "old" personnel are, again, "strangers"; replacements have not yet had their first combat experience

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Lead Questions:

How does the mixture of one-third fresh troops change any advisable reconstitution policy, or does it?

* "New" soldiers are still "strangers"
* Normally, mixture of rested personnel does improve overall unit performance capability

How much weight must be given to the relatively low training status ("marginal" at best) of the replacements?

* Basic tactical skills may be marginal
* Guidance by, or direction from experienced "old" personnel likely to be ineffective at this stage

What special roles might be assigned to fresh officers and senior NCOs so as to use best their capabilities?

* Use officers to do planning, also to crosscheck all "thinking" of officers who have been continuously fighting
* New NCOs backstop their opposite numbers among "old" personnel

Case 7: Continuous Combat Operations

PART 3

Group B Discussion

How much gain in true capability can the Commander expect as the result of the receipt of fresh troops? To what extent might mission performance reliability change now? How should these factors enter into tactical planning?

Purpose:

To provide practice in assessing actual mission capabilities in the light of changed circumstances and changes in determining factors.

Key Points:

1. Unless rested (and, if possible, extensively) only minimal performance capability remains with personnel who have experienced 108 hours of continuous, intense combat
2. CONUS replacements lack adequate training as well as battle experience
3. For practical purposes, possibly pass leadership (temporarily) to inexperienced, but more rested, officers and NCOs

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Lead Questions:

In what ways are the Division's tactical capabilities changed through infusion of new personnel?

* Mental (thinking, decision making) task capability will be improved
* But, consider lack of battle experience and understanding of status of "old" personnel

Could a recommendation to the Commander for an offensive action be justified now?

* Discount, largely, capabilities of 60% personnel
* Discount, somewhat, capabilities of 30% of personnel

APPENDIX A
Command and Staff Tasks Supported by Briefing / Seminar

Command and Staff Tasks Supported By Briefing/Seminar

A. Interpret consequences of continuous operations and associated conditions for human resources.

1. Interpret salient features of future warfare against Warsaw Pact forces in Central Europe.

2. Interpret key conditions inherent in such warfare, or generated by it, that affect human performance.

3. Interpret concepts of human resource preservation.

4. Interpret categories of soldiers' combat effectiveness.

5. Interpret quantitative projections of human resource shrinkages.

6. Realize computer simulation advantages for predicting performance decrement.

7. Interpret projected qualitative changes in soldiers' performance.

8. Interpret projected decremental reliability of performance for individuals, tasks, duty positions, and units.

9. Interpret military studies corraborating qualitative and quantitative projections.

B. Project strategic consequences of performance degradation and tactical implications of these consequences for mission(s) and unit(s) over which command responsibility is exercised.

1. Project strategic considerations deriving from shrinking human resources.

2. Project overall considerations for tactical deployment of degraded units.

3. Resolve issues arising from unreliability of mission performance and accomplishment.

4. Contrast differences in continuous operations consequences for combat and for combat support (or service support) units.

5. Develop implications of troops' degraded performance relative to communications, situation reports (information), maintenance, logistics.

C. Evaluate and appraise applicability and feasibility of various potential technical countermeasures to performance degradation within individual Commands.

1. Evaluate limits of counter degradation measures as determined by human psychophysiological limits.

2. Appraise role and task restructuring (rotation) techniques for individual command.

3. Appraise techniques for identifying and selecting special talent in individual command.

4. Evaluate requirements for effective continuous operations training--

    a. practice in realistic conditions
    b. continuing practice to automaticity of performance.

5. Evaluate rationale for crosstraining priorities.

6. Evaluate techniques for learning to cope with task performance under adverse conditions.

7. Implement techniques for learning to cope with own degradation (exhaustion).

8. Appraise system adjustment and performance support techniques.

9. Evaluate techniques for countering stress through leadership, unit cohesion, and esprit.

10. Evaluate requirements for sleep, rest, and recuperation discipline.

11. Evaluate policy for building stamina through physical conditioning in individual command.

12. Implement time frame for application of the various countermeasures.

D. Formulate and assess policy concerning programs and practice designed to prepare troops for sustained, effective performance in continuous operations.

1. Formulate and assess recommendations concerning ARTEP standards.

2. Formulate and assess policy regarding a "learning-from-mistakes" policy.

3. Formulate and assess policy regarding procedural flexibility and encouragement of initiative.

G. Evaluate received reports on implementation of established policy and progress toward attainment of specified objectives.

1. Assess compliance with policy.

2. Determine status of continuous operations capability of units within command.

3. Compare progress with time frame of policy.

4. Determine deficiencies or deviations from policy evident in reports and data.

5. Evaluate problems related to policy reported by subordinate elements.

6. Revise policy, as necessary, to assure effective implementation.

7. Direct corrective actions, as necessary, to assure adherence to established policy and successful attainment of specified objectives.

H. Coordinate, as required, with other elements of U.S. Forces, or civilian authority on matters relating to implementation of policy.

1. Assure coordination of continuous operations preparation policy with potentially affected commands in area.

2. Assure cooperation of nearby civilian authorities potentailly affected by continuous operations policy.

3. Assure cooperation of social support agencies for soldiers' dependents during periods of strenuous continuous operations preparation.

4. Formulate and assess policy regarding training exercises reflecting continuous operations conditions: scope, duration, frequency, and incentives for active participation.

5. Formulate and assess policy regarding stress coping practice for all personnel.

6. Formulate and assess policy for integrated fostering of leadership, cohesion, and unit identity.

7. Assess recommendations for recognition of units' achievements.

8. Formulate and assess recommendations for sleep/rest/recovery discipline.

9. Formulate and assess policy regarding rotation and reconstitution of units in combat.

10. Formulate and assess policy for assuring dependents' safety and well being.

E. Assign staff to analysis of issues, and to formulation of recommmendations for appropriate command policy.

1. Assess implications of A, B, C, and D for area(s) of special staff responsibility.

2. Evaluate applicability and feasibility of counter degradation measures and technical recommendations.

3. Define requirements of subordinate command levels for support and guidance.

4. Formulate policy recommendations from perspective of specific staff responsibility.

5. Review policy recommendations for integration and consistency with other command policy.

6. Submit policy recommendations for integration with other commands.

F. Review (evaluate, accept, reject, or revise) policy recommendations submitted by staff.

1. Compare policy recommendations submitted by each assigned staff member.

2. Resolve inconsistencies or conflicts.

3. Assess consistency of policy with overall command responsibilities and policy.

Table A-1

Summary of Command and Staff Tasks Met by Cases

Case Type	Case No.	Part	Command and staff Tasks (see preceding list)																								
			A									B					C										
			1	2	3	4	5	6	7	8	9	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	11	12
A. Information Evaluation and Policy Formulation	1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		2													✓	✓						✓	✓		✓			
		3													✓													
	2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓													
		2															✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		3													✓													
	3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		2																										
		3																										
B. Training Plan Development and Implementation	4	1																										
		2																										
		3																										
	5	1																										
		2								✓	✓																	
		3								✓		✓	✓	✓	✓	✓								✓				
C. Combat Application	6	1																✓			✓				✓	✓		
		2																							✓	✓		
		3																								✓		
	7	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		
		2										✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		
		3										✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Table A-1 (continued)

Case Type	Case No.	Part	Command and Staff Tasks (see preceding list)																												
			D										E						F			G								H	
			1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	1	2	3	1	2	3	4	5	6	7	1	2
A. Information Evaluation and Policy Formulation	1	1																												
		2																												
		3											✓	✓	✓	✓	✓	✓											✓	✓
	2	1	✓																											
		2	✓	✓	✓	✓	✓	✓	✓	✓							✓													
		3			✓			✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓								✓	
	3	1											✓	✓	✓	✓	✓	✓					✓							
		2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓		✓	✓	✓									
		3	✓								✓	✓										✓	✓	✓	✓	✓	✓	✓	✓	✓
B. Training Plan Development and Implementation	4	1			✓	✓		✓														✓	✓	✓	✓	✓	✓			
		2				✓		✓	✓																			✓		
		3	✓		✓				✓								✓						✓						✓	
	5	1																	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		2		✓	✓	✓	✓	✓	✓	✓	✓												✓							
		3								✓																				
C. Combat Application	6	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																		
		2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																		
		3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																		
	7	1																					✓							
		2																												
		3						✓																						

APPENDIX B

Adjunct Reading Material (Handouts)

1. Reprints of Articles:

    a. Continuous operations
    b. A debt that must be paid: Sleep loss
    c. Continuous operations in Europe: Feasibility and the effects of leadership and training
    d. The human dimension
    e. Health and high command: The pains of decision
    f. A continuous operations perspective

2. Projected Effectiveness (E) for Critical Combat Tasks

3, Rules for Sleep Management

4. Advisable Work/Rest Schedules Under Stressful Battlefield Conditions

5. Effects of Prolonged Continuous Operations on Soldiers' Performance

6. Flow of Counter Degradation Measure Preparation

7. Counter Degradation Measures - Strategies and Tactics

8. Applicability of Counter Degradation Measures for Conserving Various Abilities

Continuous Operations

By Captain George R. Frank

"My men had been moving and fighting for 39 hours since leaving Ein-Hotsev. Before we could enter the perimeter, the dropped battalion had to lift mines and roadblocks. These jokers had posted a sign over the entrance: "International Boundary, Show Your Passports." I noticed that no one with me laughed and I took it as a sign that we were wearing fine. Some of my officers had gone 3 nights without sleep—I hadn't closed my eyes in 70 hours.

"At 2300 hours, after getting a full report on the local situation, I called all commanders together to issue orders for the organization of the expanded camp and for completing the capture of Mitla Pass. I still felt fairly good—maybe that was because I had ridden near the front of the column where the dust, and consequently, the fatique had been less. What I planned to do was tell them that we would again carry on at about 0400. That would get us to the Pass by first light, and I figured that 5 hours sleep would be enough.

"But I didn't get the words out. As I started speaking, I looked at the men facing me. Every man was sleeping. At that, my words blurred and I toppled over. Nature simply took over. I slept for 4 hours and 15 minutes. I could have used more, but an air drop came in and one 600-pound bundle landed 3 feet from my head. That wakened me and reconvened the conference."

Decision in Sinai, by Lieutenant Colonel Moshe Rose as told to Brigadier General S. L. A. Marshall.

While advanced technology has developed weapons systems that are able to operate with little "down time," man, on the other hand, remains the same fragile organism he has been since the beginning of time. Man then is the "weak link,"—the most vulnerable, but also the most vital component of any of our weapons systems.

When discussing the factors that degrade crew performance it is desirable, for the sake of simplicity, to categorize these factors into two broad areas; physiological and psychological.

Physiological Performance Degraders

Fatigue is probably the foremost degrader of performance. It can be easily understood that in a modern battlefield environment, with the capabilities of advanced weapons systems, man will be the only part of the system unable to sustain long periods of operation. Very little research has been done in this area and nearly all the studies that have been done are based primarily on noncombat situations, usually involving aircraft or naval crews performing technical tasks. There are however, several recent studies on which the recommendations of this article are based.

A recent experiment in England (Exercise Early Call) tested the effects of fatigue due to sleep-loss.[1] In this study, three platoons of infantrymen were tested. One platoon was given 3 hours sleep per night. A second platoon was given 1½ hours of sleep each night, and the last platoon was deprived of all sleep.[2] Over a period of 9 days the platoons were required to develop and improve several battle positions, go on ambush and reconnaissance patrols, and defend their battle positions. The platoon that received 3 hours of sleep each night remained an effective combat force throughout the entire 9-day exercise with only unrelated medical problems causing the loss of personnel.[3]

The platoon that had received only 1½ hours of sleep each night progressively lost energy, personal initiative, group coherance, and organization, until after 4 days they were able to rally only to immediate challenges. On the fifth day, they lost 50 percent of their personnel due to extreme fatigue and exposure.

No one from the third platoon, which was deprived of all sleep, completed the test. From the end of the fourth day until the middle of the fifth (after a period of 90 to 104 hours of continuous wakefulness) the entire platoon was gradually withdrawn from the test because of extreme fatigue and the inability to stay awake. Even after three days, or 72 straight hours of wakefulness, most of the platoon had ceased to be an effective combat force.[4]

Another significant result of the test showed that about 9 percent of the "sleep-deprived" and "1½ hour-sleep" groups reported unusual visual experiences or hallucinations after 3 days, they were unable to communicate verbally, their sight was restricted, and their auditory senses virtually unstimulated.

Studies indicate that performance and efficiency begin to deteriorate after 14 to 18 hours of continuous work and reach a low point after 22 to 24 hours. Performance improves somewhat during the next 8 to 10 hours but begins to decrease again thereafter.[5] After 24 hours of continuous duty at a new or a monotonous task, degradation of performance becomes evident. Most tasks involving cognitive or perceptual skills, such as planning or interpreting complex data, begin to show a performance degradation after 36 to 48 hours of continuous wakefulness. Seventy-two hours of wakefulness is about the limit of endurance, after which personnel cease to be effective.

Schedules of sleep/work are also important factors in determining the amount of sleep loss that will impair performance.

Twenty-four hours of wakefulness will impair performance if it is imposed on a crew that has completed a week on a

4-hour work—2-hour rest schedule.[6] The same 24-hour period of wakefulness will cause impairment to performance of crew on a 4-hour work—4 hour rest schedule, after 2 weeks on the schedule.[7] This indicates that crews on a "4-off-4-on" schedule are less affected by sleep loss than those on a 4-on—2-off schedule.

The jobs that sleep loss affects most seem to be jobs that require monotonous tasks, jobs requiring continuous attention, tasks performed on a time-shared basis with other tasks that are relatively unlearned.[8]

In order to minimize the effects of sleep loss, the commander must be able to recognize the signs of sleep loss on performance. These effects are noticeable as: slower reaction time; increased time to perform a known task; short-term memory decrement; impairment in learning speed, reasoning, and complex decision chain; errors of omission; lapses of attention; irritability; depression, and erratic performance.[9]

It has been demonstrated that the diurnal cycle (day/night cycle) has a significant effect on performance.[10] When personnel become used to a set pattern of work/rest periods, where rest periods occur at the same time each day, they become adapted to this schedule. Any deviation to this schedule that changes the rest period will result in performance decrements. Biological adaptation to work/rest schedules may take from 20 to 30 days.[11]

To employ a work/rest schedule during the heat of battle is out of the question; however, a strictly-enforced sleep plan is vital when possible, for example when occupying and preparing a battle position before enemy contact or during assembly area operations. A work/rest schedule of 4 hours work and 2 hours rest will not degrade performance over a period of a few days but will be less effective than a 4-hour work and 4-hour rest schedule in the long run.[12]

A recommended sleep plan would furnish each soldier with a minimum of 4 hours rest each 24 hour period. This would not, in all probability, be as effective over long periods of time as a sleep plan where personnel would receive 6 or more hours. Four hours rest for each 24-hour period would probably sustain personnel for several weeks if they did not have jobs that require complex decision making, but they would probably begin to show signs of exhaustion after 2 weeks. For periods of 1 to 2 weeks, a unit could possibly maintain combat effectiveness on 3 hours of sleep per 24-hours. This appears to be about the limit, however.

For personnel in highly-technical jobs that require constant monitoring or vigilance, a rest plan of 4 hours on and 4 hours off would be best. Anything less than 4 hours would result in a decrease in vigilance and perceptive abilities.

Another aspect of sleep loss that must be considered is the time required for recovery from the effects of sleep loss. If a commander knows his unit will be undertaking a long period of combat or prolonged work, it is recommended he give his personnel 12 hours of sleep or rest before the operation and awaken them no more than 2 hours before the operation begins.

After an operation of 36 to 48 hours of continuous wakefulness, 12 hours of sleep or rest is required to return personnel to normal functioning: however, subjective fatigue may linger for 3 days.[13] If a high level of activity, such as combat, is undertaken during this period, personnel may need two 12-hour rest periods to attain complete recover.[14] After 72 or more hours of continuous wakefulness, personnel may need as much as 2 or 3 days of rest for recovery of normal performance.

To minimize the effects of sleep loss, the commander has several options. Possibly the best solution for staff personnel is periodic breaks and mild exercise. Some of the exercises recommended are "Range of Motion" and "Strength and Stamina" exercises involving stretching and tensing muscles without requiring a lot of space.[16] Examples of these can be found in, *Biotonics, Stamina Through Six-Second Exercises That Really Work.* Among combat crews, the commander may rotate tasks if the crews are cross-trained. It must be noted, however, that varying tasks through job rotation works only if the jobs include tasks with different human requirements, (gunner to loader or driver).[17] Job rotation also requires a highly-trained crew if the jobs are complex. Prior to combat, effective training and experience will reduce the effects of fatigue.[18]

The two categories of personnel who can be expected to show signs of fatigue first are: the young immature soldier who is unsure of himself and the seasoned old soldier upon whom others have relied and who has sustained them at the cost of his own fatigue.[19] Commanders (leaders) often regard themselves as being the least vulnerable to fatigue, but in fact, tasks requiring the quick reaction, complex reasoning, and detailed planning, that they perform, make leaders the most vulnerable to sleep deprivation.[20] "The display of sleep self-denial as an example of self-control by leaders is extremely counterproductive."[21]

Once the battle has started and there is contact with the enemy, sleep plans, job rotation, and rest periods may become impossible. However, under the "Division '86" concept with four maneuver companies in each battalion, the commander may be able to rotate companies out of contact, enabling them to get at least a temporary break in which rest will be equally as important as maintenance and resupply. Currently, this could possibly be done at brigade level, pulling battalions out of contact for rest, rearming, and reconstitution. Care needs to be taken not to rely exclusively on the performance of certain individuals, teams, or units so that each are rested in turn.

Medicines provide another means for increasing performance during periods of fatigue, but the use of medicines to improve performance has largely been condemned in our society. It also must be realized, that no performance improving drug is without side effects and that frequent repetition can lead to

serious consequences.

Caffeine from coffee, theophylline from tea, and theobromine from cocoa are purine derivatives. These substances, especially caffeine, excite the central nervous system. "Consciousness is brightened, thought association takes place faster and clearer, reaction time is shortened, motor actions are increased and feelings of tiredness and sleepiness disappear."[23] Muscular performance capability is increased most by caffeine and least by theobromine. "In cases where requirements exist for intensified performance capability for *short-term* operations several large mocca cups of coffee, direct caffeine, caffeine drinks, or cola preparations can achieve the desired goal although not without limitation. In cases where longer endurance periods are required, they show no improved results."[24]

Temperature is another performance degrader that has a profound physiological effect and a somewhat lesser psychological effect on soldiers during continuous operations.

Even though the human body is less adaptable to cold than to heat, cold has less of an impact when considering an armored vehicle crew's performance. Exposed infantrymen are more susceptable to cold injuries than tank crews because body heat and equipment-generated heat within the vehicle raise the ambient temperatures. Exposure to cold for 2 to 3 hours reduces hand strength 20 to 30 percent. If gloves are worn, manual dexterity is diminished, and the combat effectiveness of the armored vehicle is reduced. For leaders, continuous operations in cold weather require extensive logistical planning. Soldiers will need to be resupplied with additional clothing, fuel, and food, and, in extreme cold, they may require special equipment such as arctic parkas and mittens. For well-protected, well-fed soldiers, cold is probably more of a psychological stressor than a physiological hazard.[25]

Heat, however, is of much more concern than cold, and personnel in tanks or other armored vehicles suffer most from intense heat. As a general rule, any temperature above 90° F will degrade crew performance, and a wet-bulb-globe temperature (WBGT) of 85° is the maximum for effective crew performance. A WBGT of 81.3° is considered ideal, 85° is the maximum acceptable temperature for working conditions, and 90° to 95° will cause casualties.

Surface temperatures of areas with which the crew may come in contact can cause extreme discomfort or even blister the skin. For instance, during tests in the Yuma desert, surface temperatures reached as high as 155°, while WBGT measured 106°.[29]

When anticipating operations in hot climates, commanders and staff should plan for a 3- to 12-day period for troops to become acclimated.[29] Acclimation is faster if soldiers perform work or mild exercise rather than rest during the acclimation period. Physically fit troops acclimatize at a dramatically quicker rate than the unfit.

When a unit must operate "buttoned up" in mission-oriented, protective posture (MOPP) the problems of heat casualties are multiplied. Infantrymen are able to operate efficiently for only about 20 minutes in temperatures of 75° to 90°F where high energy expenditure levels are required.[30] This creates an even greater problem for armor crewmen, operating in an environment where engine, radios, and weapons are producing heat.

During a test of the *M-1* at Yuma Proving Ground, Arizona in September 1980, crewmen were exposed to an inside WBGT of 89°F and an outside (dry-bulb) temperature of 102°F.[31] They were clothed in full MOPP IV ensemble (protective mask with hood, chemical protective overgarments, gloves and boots) and conducted crew duties with blowers off and hatches closed. The crew simulated firing the main gun by loading and unloading a "dummy" round and traversing and elevating the turret. After 1 hour the crew lost effectiveness, and 20 minutes later the test was terminated for safety considerations. The test demonstrated that a tank crew, fighting "buttoned up" in a full MOPP ensemble, on a 100°F day will begin to show heat stress in less than 1 hour and experience heat casualties in less than 2 hours.[32]

To lessen the effects of heat stress, leaders should closely monitor NBC hazards and impose high MOPP levels only when necessary. In some situations it might be appropriate to wear NBC protective clothing over underwear, remove hoods, open hatches and turn on blower motors.

Dehydration creates the most ugrent problem in operating in a hot climate. At daily mean temperatures of 90°F, soldiers resting in the shade need 6 quarts of water per day.[33] Moderate work at this temperature raises the requirement to 8 quarts per day, while soldiers doing heavy work for 8 hours at this temperature need 12 quarts of water per day. At a daily mean temperature of 120°F, personnel resting in the shade need 17 quarts of water per day, while personnel working moderately hard will need 20 quarts, and soldiers working hard in the sun will need at least 25 quarts of water per day.[34]

The Israeli system of overdrinking is successful in combating dehydration. Each leader constantly insures that his personnel drink water. Water is consumed once an hour for temperatures below 100°F and twice an hour for temperatures above 100°F.[35] To insure proper water consumption a urine color check is made. Dark urine color indicates a water deficiency.[36] Soldiers should not be allowed to consume cold beverages that could reduce sweating and cause overheating. Alcohol consumption should be strictly forbidden as it requires extra water for the body to process.[37] Water loss can be reduced by the conserving sweat. This is done by wearing the complete uniform with the sleeves rolled down and the head covered. Clothing helps ration sweat by absorbing it and through

evaporation cools the body. Salt is also lost in sweat, but salt should be given only when recommended by medical personnel.

When operating in hot climates, soldiers require a minimum of 6 hours rest per day and 15 to 20 minutes of rest per hour when performing hard work.[38] It may be necessary to schedule periods of heavy physical activities during the night or early morning hours when temperatures are lowest.

Other factors that physically degrade crew performance during continuous operations are noise and overpressure. These factors are significant degraders of performance. There is little that commanders can do to lessen the effects of either of these factors, however it is important to know the causes and effects of each.

Noise is an occupational hazard that especially affects armor crewmen. Not only is noise an annoyance but it interferes with communication, and if the noise is experienced for long periods it may cause temporary hearing loss.[39] Therefore, commanders should enforce the wearing of protective devices even though these devices restrict and inhibit communication.

Overpressure caused by large explosions nearby is similar to noise and results from the pressure waves in the atmosphere. Overpressure may cause lung hemorrhage, eardrum rupture, and air bubbles in the blood stream.[40] Personnel in armored vehicles are somewhat protected. In foxholes personnel may receive greater overpressure than in the open due to the reduction in square area at the bottom as compared with the opening, creating a funnel effect. Nuclear bursts will likely cause large numbers of casualties by overpressure. Conventional munitions create mainly an annoyance but may burst eardrums.

Psychological Performance Degraders

Psychological Stress is an important area of discussion when considering factors which degrade performance. What causes stress? Simply put, stress is caused by a situation in which adjustment is difficult or impossible to overcome but the motivation to overcome the situation is strong.[41]

The primary stress of the battlefield is the fear of disfigurement, mutilation, intense pain, death, or even fear of loosing face within a peer group. Fear is universal in combat and it is accepted that everyone will experience fear. It becomes a problem, however, when it seriously degrades performance or leads to bizarre behavior.

In the next war commanders must be prepared to deal with large numbers of psychological casualties within the first few hours, due to the vast destructive potential of modern weapons systems and the extreme violence and speed of the modern battlefield.

There seems to be a close association between neuropsychiatric casualties and "wounding rates." Studies have also indicated that the intensity of the conflict as well as the time spent in combat are big factors. Lastly, the relative activity or inactivity of the soldier is closely related to neuropsychiatric casualty rates.[42] Stalemate, inability to retaliate, and idleness cause a marked increase in the number of neuropsychiatric cases.

A. J. Glass has stated that fear and exhaustion during intense combat will surface eventually and almost everyone has a breaking point.[43] A breakdown of pyschological defenses against fear is evident in over 50 percent of nonbattle casualties. He divides these casualties into five groups.

In *Group I* individuals report to the aid station with minor organic disease or injury that would result in little if any incapacitation. Their medical condition thinly disguises a pyschological breakdown.[44]

In *Group II* individuals have subjective complaints but negative findings—backache, headache, diarrhea, or weakness. Such symptoms represent an unconscious attempt to withdraw from an intolerable situation.[45]

In *Group III* individuals appear with self-inflicted wounds or other nonbattle injuries that could have been avoided, indicating either a conscious or unconscious attempt to flee the battlefield.[46]

Group IV contains the soldiers who have lost or broken eyeglasses or dentures, which will keep the men out of combat only temporarily.[47]

Group V soldiers are those suffering complete psychiatric breakdowns, who have lost their ability to cope with the situation of combat.[48] This group of casualties is completely ineffective.

Israeli experiences during the 1973 war have shown that elite units have fewer neuropsychiatric casualties.[49] This would seem to indicate the importance of unit cohesiveness, interpersonal relationships and esprit-de-corps.

There are many ways in which positive leadership may also play an important part in reducing the number of neuropsychiatric casualties. The spirit of the offense is a practical technique to reduce the impact of fatigue and fear. Purposeful, aggressive action brings relief from combat tension.[50]

Furthermore, a soldier's attitude and performance in training is related to his performance in combat. Realism in training improves a soldier's ability to withstand combat stress. Training should emphasize the sights and sounds of the battlefield. It should produce fear provoking situations that develop the soldier's knowledge of himself, his enemy, and his weapons.

Confinement is a potential stressor that may affect the behavior of the crew members when "buttoned up" for long periods of time.

Confinement may cause "status leveling." Because of the lack of privacy and the inability to maintain social distance between superiors and subordinates, authority may be undermined.[51] Anger, scorn, and ridicule may be directed at superiors. "Status leveling" reduces authority and the leader becomes only another member of the crew. Confinement may

also foster territorial behavior, with possessive feelings toward certain locations or items within the vehicle.[32] The tank commander should allocate space with very explicit rules and use of resources.

Confinement in a "buttoned up" tank also causes problems of crew performance due not only to psychological stress but also to the physical limitations imposed on vision. Crowding causes stress through a disruption of individual "personal space."[33] In a hostile or stressful environment such as combat, the need for interpersonal distance between individuals increases. During daylight, target detection is degraded from 8 to 25 percent during closed hatch operation.[34] Navigation is degraded 8 to 26 percent and takes 11 to 40 percent more time,[35] while obstacle neogtiation takes from 21 to 99 percent more time.[36]

At night target detection is degraded 8 to 46 percent.[37] Navigation is degraded 14 to 39 percent and takes 19 to 54 percent more time.[38]

MOPP also increases the effects of confinement. A "buttoned-up" *M-60A1* allows only two crew members to don protective clothing at a time, one at the commanders station, one at the loaders station, and it requires 16 minutes even with practice.[39] The *M-1* Abrams has a smaller crew compartment, and thus, will require even more time, suggesting that crew members should wear protective clothing if there is a possibility of chemical warfare.

Infantrymen are also affected by long confinement in armored personnel carriers and fighting vehicles by temperatures, vibration, blast effects, acceleration and deceleration, high noise level, air pollution, sleep deprivation, and body restriction.[60] The effects of body restriction impairs movement for only short intervals after dismounting.

It is essential that we begin training to combat physiological and psychological stressors by realistic, stressful training. Leaders at every level of command must realize that a viable work/rest plan that includes commanders and staff must be implemented. Additionally, simulated neuropyschiatric battle casualties should be incorporated into every field training exercise and ARTEP to adequately train our personnel for continuous operations.

Whenever planning is being done by commanders and staff, emphasis must be placed on the human factor of every weapons system. Although training, proper planning, and other techniques may extend the amount of time a crew may remain combat effective, the human being is still the most vulnerable and valuable asset in the Army inventory.

Footnotes

[1]MAJ Gregory Lucas Belenky, "Unusual Visual Experiences Reported by Subjects in the British Army Study of Sustained Operations, Early Call", (US Army Medical Research and Development Command, Fort Detrick, Frederick, MD October 1979) p. 695.
[2]Ibid.
[3]Ibid.
[4]Ibid.
[5]Albert L. Kubala and William L. Warnick, "A Review of Selected Literature on Stresses Affecting Soldiers in Combat" (Human Resources Research Organization, Alexandria, VA, May 1979), p. 3-13.
[6]"Human Performance and Military Capability in Continuous Operations," (The Technical Cooperation Program, Washington, DC, December 1974) p. B-2.
[7]Ibid.
[8]Kubala and Warnick, p. 3-14
[9]"Human Performance and Military Capability in Continuous Operations", p. B-2.
[10]Donald F. Haggard, "Human RRO Studies in Continuous Operations" (Human Resources Research Organization, Alexandria, VA, March 1970), p. 3.
[11]Kubala and Warnick, p. 3-15.
[12]Ibid.
[13]"Human Performance and Military Capability in Continuous Operations", p. B-3
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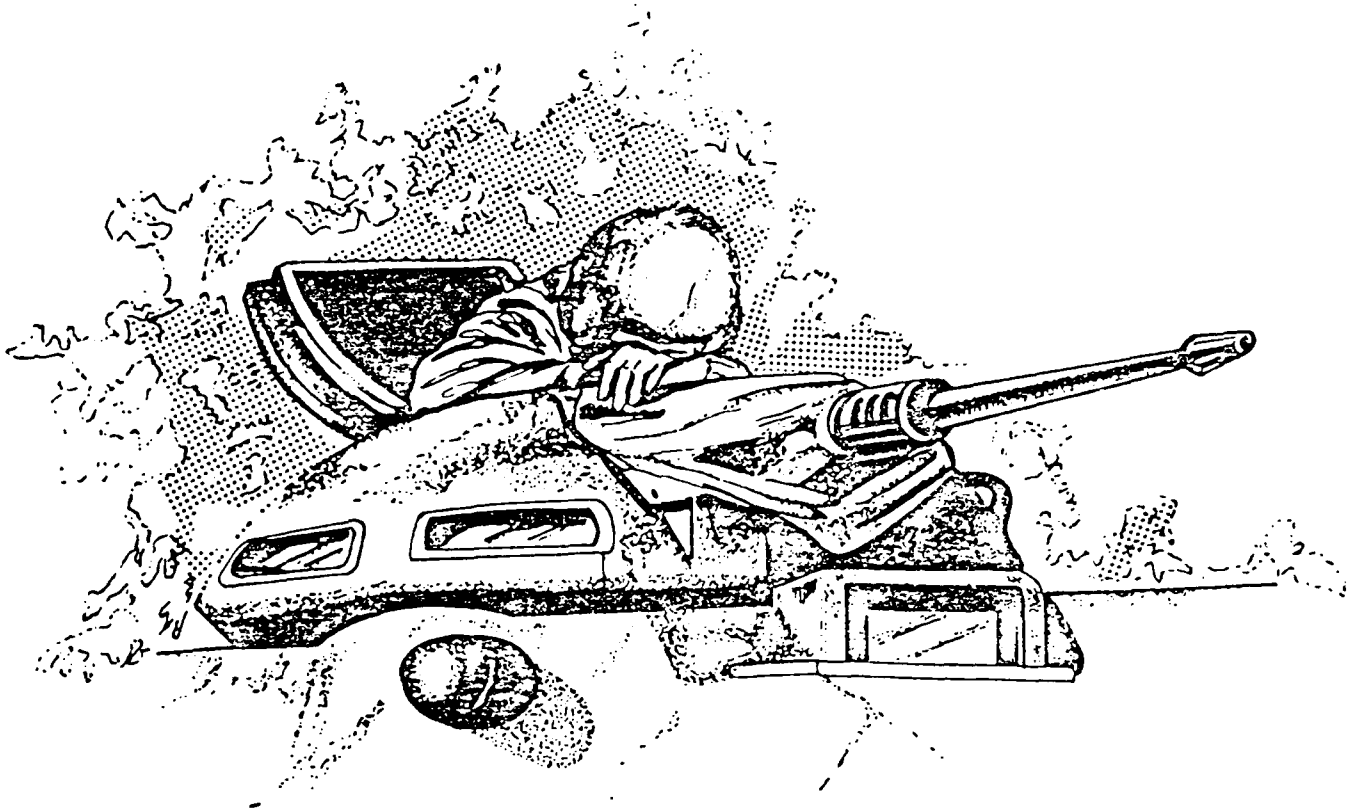
A Debt That Must Be Paid

SLEEP LOSS



by Captain Richard P. Geier

It is 0230 hours, the team is deployed in a night defensive position on the third night of a joint training excercise. The team commander is in his tank slumped over the M-36 sight box. The radios are turned up. A report from the scout platoon blasts over the radio. A company-sized force is moving toward the team's position. The commander attempts to alert his platoon leaders. One answers immediately, but the others do not respond. Frantically, the commander sends his loader to alert the platoons while he curses himself for dozing, the company CP for not keeping the platoons on the net, and the platoon leaders for not monitoring the radio. Fortunately, the team commander is able to awaken his unit, maneuver, and destroy the enemy force. After the exercise is terminated, the commander wonders what happened to the sleep discipline that had been stressed during the previous month's training and ARTEP. Because of safety constraints, night operations were limited to static defense. The company's SOP called for 50 percent alert during a night defense, which would require two people asleep in each tank at all times. So why were the troops so exhausted? What condition would the unit be in after 4 days and 3 nights conducting an active defense against the Threat in Europe? Could sleep loss lose the first battle of the next war?

Few studies are available on the effects of continuous operations on soldiers. Research conducted by the Navy reveals that sleep loss is the most detrimental factor to extended operations. The emphasis of their research is on the effects of sleep loss on sailor's work efficiency. The results indicate the following:

- The mean duration of sleep under normal conditions is 7.5-8 hours.
- Younger individuals (20-39) require an average of 1 hour more sleep than the older group (40-59).
- The human body is not equipped to anticipate shortened sleep cycles and to adapt accordingly.
- Failure to receive the required sleep results in a backlog or sleep debt. The only way to eliminate this debt is to allow an individual 1 hour of sleep in addition to his normal required amount.
- Performance degradation as pertains to vigilance does not disappear with less than 3 hours of sleep.
- A minimum of 5 hours of sleep is required to enable an individual to maintain an acceptable level of consistent and reliable performance.
- The physical and psychological recovery from the effects of sleep loss is accomplished by the acquisition of the normal, uninterrupted sleep period.
- High stimulus or motivation will readily override the detrimental effects of sleep loss on performance for a short period of time.

Many studies on continuous work have been done by civilian universities under Army contract. These studies

were conducted in a laboratory using college students as test personnel and because of this the results are not totally valid for Army use. However, some data can be of use to the Army in predicting effectiveness and perhaps lessening the effects of sleep loss. These effects are:

- The first work performance decrements occurred after approximately 18 hours of work. During the early morning hours of the first night, average performance decreased to approximately 82 percent of the baseline performance. During the first half of the second day, performance improved to about 90 percent of baseline, but decreased again during the second night to approximately 67 percent of baseline. Recovery of performance baseline was complete after a 24-hour period of rest and recovery.
- Following 36 hours of continuous work, 2, 3, and 4 hours of sleep yielded an immediate recovery in performance of about 76 percent, 56 percent, and 75 percent, respectively, whereas 4 hours of sleep following 44 hours of continuous work produced only a 39-percent recovery.

"Commanders must cope with the effects of sleep loss on their own performance as well as their troops. They must train and trust subordinates to command their unit while they sleep."

- A temporary improvement in job performance, speed,and accuracy after sleep loss is common. However, this improvement requires nearly three times the expenditure of energy and over a period of time, work output drops alarmingly.
- Physical strength remains unimpaired until extreme levels of sleep starvation are realized.
- Moderate exercise, especially of the large muscles of the body, tends to increase alertness and helps sustain good performance.
- The most difficult jobs for the sleep-deprived individual are ones which require sustained attention to brief, intermediate signals and those that require complex, swift decisions or planning.
- Sleep loss typically causes errors of omission, not commission.
- Continuous operations can increase an individual's caloric needs to as much as 10,000 calories a day. There is some data to suggest that sleep loss leads to iron deficiency, vitamin B deficiency, dehydration, and an impaired capability to fully utilize glucose as an energy source.
- Prolonged thermal exposure, confinement, noise and vibration stress (all present in armored vehicles) degrade performance and ability to cope with sleep loss.
- The degree of job training may affect continuous work performance. Studies indicate that highly-trained individuals can be expected to work continuously at 50 percent of their maximum for a period of 8 hours, whereas untrained individuals cannot be expected to work at much more than 25 percent of their maximum over the same period.

To minimize the effects of sleep loss, commanders should consider the following action:

- Insure that troops are motivated, trained, and properly led.
- Provide increased rations, water, vitamin B, and iron supplements to sustain troop effectiveness under the stress of sleep loss.
- Increase supervision during the hours of 0100 to daybreak to offset the reduced vigilance during these hours.
- Insure that troops receive some sort of exercise. If possible get them away from confinement, noise, vibration, and excessive heat or cold stress for a period of time. Even stopping the tank, and walking around it to check the track and suspension may help.
- In a lull in the battle, give half of the unit 7 to 8 hours of uninterrupted sleep rather than split the watch and give each half 4 hours.
- Realize that the younger the soldier, the more sleep he requires.
- Accept as a natural law that the human body cannot anticipate shortened sleep cycles or sleep loss. Neither through practice nor any other means can soldiers perform effectively with a sleep debt for an extended period of time.

Most importantly, commanders must cope with the effects of sleep loss on their own performance as well as their troops. They must train and trust their immediate subordinate to command their unit while they sleep. Command decisions in future battles cannot be degraded by sleep loss. We can no longer afford to let our executive officers dedicate themselves to maintenance problems and run themselves into exhaustion doing a motor sergeant's job. They must be aware of the tactical situation, receive adequate rest, and be trained and capable of conducting tactical operations while the commander sleeps.

These "tips" may help reduce the effects of sleep loss for 48 hours or less, but what can be done if troops are required to function for over 48 continuous hours? Drugs to prevent sleep are not the answer, since harmful side effects and individual variation of dose rates seem to be an insurmountable problem. Drugs or devices to induce sleep and give an individual an equivalent 8 hours of sleep in 1 hour or less do not appear to be available in the near future because of harmful side effects.

Will units conducting the active defense against the Threat in Europe have lulls in the battle that will allow sleep recovery? It is not likely. Since 1954 the Threat has made continuous combat operations the main principle of their combat doctrine. Their doctrine states, "the offensive...will be conducted night and day...without letup until the enemy is defeated."

Four days after the battle begins the Threat will have rotated units into the battle. Will we be able to defeat these units or will the Threat forces find American soldiers asleep in tanks, trucks, and foxholes?

Unless our need for sleep is overcome or our force structure is redesigned to rotate units in and out of the battle, sleep loss could lose the first battle of the next war.

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CONTINUOUS OPERATIONS IN EUROPE: FEASIBILITY AND THE EFFECTS OF LEADERSHIP AND TRAINING

by

FREDERICK J. MANNING

"The offensive . . . will be conducted night and day, in any weather, without letup until the enemy is defeated." With these words, Soviet author A. A. Sidorenko summarizes an element of Soviet military doctrine which has significance for the US, although we have only recently begun to appreciate it.[1] Our current "model" of the next European war is based on conflict between Warsaw Pact and NATO forces, with the latter waging a determined and aggressive defense against an enemy vastly superior in personnel, armor, and artillery. Strategy and tactics have been revised to counter this numerical disparity,[2] but seldom has the issue of continuous operations been addressed, beyond acknowledgement that they may well be required. The NATO approach still clings to the notion that there are only a few operations suited for night.[3] Approach marches, withdrawals, river crossings, and reconnaissance are billed as natural nighttime activities. Combat itself is presented as a problem for technology, to be solved by more and better night vision devices. All this is true, of course, but it tends to hide the issue. Night fighting capability is unquestionably necessary for continuous operations, but it alone is just as surely not sufficient.

The extent of this oversight can be gauged by the three- to five-day boundary conditions implicit or explicit in US discussions of continuous operations. This sort of combat, where the major problem lies only in evoking heroic efforts from the troops and equipment on hand, is certainly not what the Soviets mean by continuous operations. Further, REFORGER's division-plus notwithstanding, there is little reason to expect reinforcements in significant strength to arrive from the US in less than three to five weeks, much less three to five days.[4]

To the extent that we look to night vision devices, strategic warning systems, and bigger and better weapons for solutions, we miss the fundamental problem posed by continuous operations: machines can be run without letup; human beings cannot.

In a first effort to explore behavioral implications of continuous operations, the

US Army Medical Research Unit, Europe spent six months observing the day-to-day operations and training of a field artillery battalion in Europe. It was clearly not within the research unit's purview to arrange a continuous round-the-clock field exercise. Instead, we observed the battalion as we found it in a combat training environment, looking for "fault lines" along which such a unit might crack under the stress of that first long battle.

Direct observation was the primary means of collecting data in this study. However, observation was supplemented by informal interviews with troops during breaks, mealtimes, and after-duty hours, and, in selected cases, by formal interviews and questionnaires, as well as analysis of documents, records, and "third party" evaluations such as the Annual General Inspection (AGI). Important battalion events occurring during the period of our observations—May through November 1978—were an AGI; a two-week period during which elements of the battalion were tasked to support a National Guard unit in training at the Grafenwoehr Training Area; and the battalion's own annual two-week training period at Grafenwoehr, culminating in a formal evaluation by group headquarters in July. Also observed were the annual Nuclear Surety Evaluation, Exercise Certain Shield (REFORGER 78), a battalion "ammunition upload," and the battalion's annual Army Training and Evaluation Program (ARTEP) evaluation of its firing batteries at Grafenwoehr. While at the latter site, we were able to observe a National Guard 8-inch battery which was selected for training in Europe by virtue of superior performance in the United States, and a 155-mm howitzer battery specifically tasked to maintain high rates of fire for a 12-hour period. This study also incorporates relevant information gained through visits and correspondence with research colleagues in the US, Great Britain, Norway, Israel, and the Federal Republic of Germany.

FATIGUE AND PERFORMANCE

Nothing we have seen has undermined our laboratory and history-derived assumption that psychological rather than physiological exhaustion is the critical problem in any extended operation. That is, the question concerns not sleeping on the job, but persisting in a job until mental errors destroy the unit. In practice, the performance of decisionmakers such as the commanders and the battery XOs, and those whose jobs involve primarily cognitive skills, such as battalion staff, Fire Direction Center personnel, survey sections, chiefs of firing batteries, and communications equipment operators, will very likely be more susceptible to the stress of continuous high-intensity combat than those with more labor-intensive jobs. Our own observations, particularly during battalion and battery evaluations at Grafenwoehr, and during REFORGER 78, suggest that a high proportion of artillery unit members can and will manage short naps even in conditions which would, *a priori*, be judged as extremely unfavorable in terms of physical comfort and noise level. These naps ought to be encouraged by and at all levels of command. They are, however, constantly undermined by the common myth that sleeping is unmanly or a manifestation of poor discipline. This myth is nowhere more established than among commanders themselves. The latter, although often in enthusiastic agreement about the benefits of sleep, quite often approach sleep like a monk does sex: a harmless enough activity for lesser men, and a good opportunity to exercise willpower and demonstrate superiority through conspicuous self-denial. This portrayal represents, of course, an oversimplification, but it must be emphasized that, unlike physical laborers, whose work *quantity* is decreased by fatigue, decisionmakers and other mental laborers will have their work *quality* degraded. Such degradation, particularly when unrecognized or unacknowledged, clearly places the unit in greater danger.

Data from a variety of other sources support these conclusions. Biochemical studies of a Special Forces "A" Team conducted during the Vietnam conflict found that with one exception, the officers showed higher levels of 17-hydroxycorticosteroid (a

classical indicator of stress) both at rest and in response to an enemy attack on the camp.[5]

The Norwegian Defense Research Establishment has published several studies on the effects of a prolonged state of sleep deprivation and hard physical labor. A recent study reported on a group of 44 cadets of the Royal Norwegian Military Academy participating in a ranger training course demanding the expenditure of 8000 to 10,000 calories per day.[6] One group was given no organized sleep for the five days of the course, while other groups got three and six hours of sleep, respectively, during the early morning hours of the third day. Each morning from 0630 to 0830, formal laboratory testing was conducted, using a variety of tests of both physical and mental functioning. While all the tests showed substantial and progressive erosion, of particular relevance are the findings that a coding test and a command memory test were far and away the most sensitive. The former required the subjects to substitute digits for symbols for five minutes, using a code unknown until the test. In the command memory test, cadets were given two minutes to memorize a standard military message. An hour later, after an especially strenuous physical task, they were asked to write the message. The average scores on both these tasks dipped to 65 percent of pre-course levels, and coding was significantly impaired after only 24 hours into the five-day course (command memory was not tested at 24 hours for some reason). By way of contrast, shooting (grouping at 25 meters) showed only a 10-percent impairment, and that not until the third day of the course.

Britain's Army Personnel Research Establishment has also conducted a number of experiments in the area of continuous operations.[7] These were nine-day tactical defensive exercises carried out by experienced infantry platoons. They were observed and rated continuously by both military and civilian scientists as well as infantry company commanders. In one test, no sleep was scheduled for one platoon, 90 minutes a night for a second platoon, and three hours per night for a third. The aim was to see how many days they would remain in the field (subjects were free to withdraw from the experiment at any time). Military performance (shooting, weapons handling, digging, marching, and patrolling) was assessed throughout, as well as performance on a battery of pencil-and-paper tests of map plotting, coding and decoding, memory, and logical reasoning. Results showed that the platoons became militarily ineffective after approximately three, six, and nine-plus days, respectively. Well-learned and mainly physical tasks were highly resistant to deterioration from lack of sleep, but tasks with a cognitive or vigilance component were markedly susceptible. For example, a platoon of sleep-deprived soldiers was able to maintain its speed of march cross-country, but to its ultimate detriment, because the platoon leader could no longer read his map properly. The formal testing basically confirmed this selective sensitivity, though map-plotting was affected far less adversely than logical reasoning and encoding and decoding. Follow-up studies have confirmed this finding, showing reductions to less than 50 percent of normal performance levels on these tests, with deterioration beginning after only one night without sleep. In addition, the occurrence of visual illusions at night was so common that the study recommended posting sentries in pairs. On the positive side, as little as three to four hours of unbroken sleep per night produced considerable improvement, both in military effectiveness and on the test batteries.

Even more germane are the findings of a joint study by the US Army Research

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Institute of Environmental Medicine and the Walter Reed Army Institute of Research employing the Fire Direction Center (FDC) as a laboratory model for investigating effects of continuous operations.[8] Briefly, five-man FDC teams from the 82d Airborne Division carried out an artillery combat scenario designed to simulate 86 hours of continuous operations (sans actual movements). In fact, no team persisted more than 48 hours before opting to quit, though some were performing adequately at that time. In all cases, however, a striking division of effort appeared as time-on-task increased. Forced-paced activities—for example, fire requests from forward observers and higher headquarters—consistently produced well-trained, orderly, and appropriate reactions, though multiple simultaneous fire missions did cause some difficulties as time wore on; however, it became apparent that the "cost" of this performance was increasing neglect of self-paced activities such as meteorological corrections, replotting targets relocated by survey or precision registrations, keeping the current tactical situation posted, plotting potential targets and no-fire zones, working up data for preplanned fires, updating records and logs, and so forth.

This same distinction between forced-paced and self-paced activities can, of course, be applied to most other sections in a firing battery and to battalion headquarters as well; the ARTEP performance we observed revealed similar patterns. For example, gun sections continued to deliver timely and accurate fire when called upon, but security declined as fatigue set in (e.g. camouflage nets were set slowly or not at all; M60 machine guns were not set up or not manned; wire sections got "hot lines" between FDC and guns in rapidly, but lines to perimeter and the switchboard were omitted). The potential impact of sleep deprivation upon the headquarters and command sections will also be apparent, since good planning ought to be self-paced rather than merely reactive to events.

The foregoing data and observations leave us more convinced than ever that it is those in mentally demanding jobs, rather than physically demanding ones, who are most at risk under conditions of acute sleep deprivation. Moreover, it is precisely these individuals, particularly the commanders, who most frequently believe they are the least vulnerable, if not completely immune.

Another dangerous misconception regarding sleep deprivation is one we have dubbed the "adrenalin theory." In brief, more than a few of our subjects have expressed the view that the increased excitement of actual combat will increase motivation sufficiently to produce all manners of previously unheard-of performances. Both laboratory studies and our observations counter this line of thought. First, although it is true that a moderate increase in arousal often facilitates performance, it is also true that beyond some optimal level, arousal tends to degrade performance. This optimal level depends upon the nature of the task, being much lower for cognitive skills and decisionmaking than heavy labor. A homely analogy exists in professional football, where linemen are allegedly encouraged to raise their arousal level by chemical means, a technique so patently disastrous for a quarterback that it is not even considered. Second, even "continuous" operations will have some lulls, at which time we can expect a parasympathetic rebound. That is, the more intense the arousal during performance, the more powerfully will relaxation and fatigue dominate during lulls. Paratroopers and amphibious personnel often experience such an overwhelming sense of relaxation upon making a safe landing that falling asleep is not unheard-of.[9] Adrenalin is thus a mixed blessing.

NEUROPSYCHIATRIC CASUALTIES

Approximately a half million men were separated from the US Army between the years 1942 and 1945 for "emotional or mental reasons," a rate of about 50 per thousand enlisted males, despite the pre-induction rejection of nearly 1.7 million (94 per 1000) for these same reasons.[10] These statistics do not reflect the considerable

improvement in prevention and treatment that took place by the end of the war, but they also fail to reflect the considerably higher rates among troops actually in combat with the enemy. J. W. Appel reported an annual neuropsychiatric hospitalization rate for divisions in combat in Europe of approximately 250 per 1000, with infantry battalion rates going as high as 1600 to 2000 per 1000 troops per year, for short periods of time.[11] A good rule of thumb seems to be that psychiatric casualties will occur in a ratio of about one for every four wounded in action.

In terms of traditional "combat fatigue," it might be assumed that 10 days is just too short a span to generate significant numbers. On the contrary! Many of the factors associated with high rates are present in current scenarios: initial contact by green troops, intense fire, high casualty rates, retrograde movements, poor communications, and physical fatigue. In fact, the Israeli Defense Forces found that 10 percent of their casualties in the 1973 war (which, incidentally, has served as a model for much recent US planning) were what they termed "combat reactions." These were men who were found wandering around in a daze or sitting quietly doing nothing, unresponsive to events and people around them. This is a low percentage of neuropsychiatric casualties, historically speaking, but this was the first war in which the Israelis had any at all! Post hoc studies of such casualties found that, although there was no "combat reaction personality," those afflicted tended to be older, married soldiers, and that close to 80 percent had been undergoing family or social crises (40 percent having had difficulties with peers or chain of command, 50 percent baby or pregnancy problems, and 23 percent a death in the family).[12] How much higher these figures might have been without the mental health professionals the Israelis routinely assign down through the company level is impossible to say, but observers from the Army Medical Research and Development Command attending a large-scale field exercise recently held at Fort Polk suggest it might be very much higher indeed. Though the observers collected no hard data, a natural experiment emerged, since only one of the divisions participating made concerted efforts, through its mental health specialists, to seek out and help resolve troop concerns about dependent problems (ranging from physical safety to paying the phone bill) arising while the men were in the field. This division sent home for domestic problems only one-tenth the number sent back by their "opponents," the 82d Airborne Division.

Although the question of "sending people back" becomes academic in the event of war, concerns in soldiers' minds about dependent care can hardly be eliminated by fiat, as the Republic of Vietnam learned in what turned out to be the final massive invasion by North Vietnam. The number of dependents in the potential "war zone" of Central Europe is now greater than 350,000, and current plans for noncombatant evacuation operations were remarkable for their lack of credibility even before the recent fiasco in Iran. Soldiers tend to be ambivalent toward the presence of their wives and families in the theater. On one hand, they want their families there in peacetime; on the other, they recognize that in the event of sudden hostilities the danger to their families would pose a severe psychological distraction. The most common response of soldiers asked was, "Are you kidding? I don't know what I'd do if it came to that!" We didn't find it hard to imagine what they might do after witnessing an E-6 slip home from REFORGER because his wife could not get to the commissary without him.

On the basis of the frequent difficulty we encountered convincing commanders and supervisors at all levels that dependents' adjustment problems did, in fact, have something to do with continuous combat operations, we suspect that data such as that presented above needs much wider dissemination than it has received. Psychiatric casualties are too important to be left to psychiatrists.

TRAINING AND LEADERSHIP

Despite the inherent limitation on live-fire training imposed by the small number of training sites suitable for field artillery in

West Germany, the units observed showed a high level of proficiency in their basic tasks. This should not be construed to mean that training is currently optimal, however, or even adequate for continuous operations.

Apart from a need for improvements in a few specific areas, we were disturbed most by the widespread tendency (unquestionably produced by pressures from above) of units to train for the next evaluation rather than for combat. While evaluation is a necessary concomitant of training, the same strained application of cost-effectiveness techniques which enshrined the body count in Vietnam now acts to stifle the very thing it is designed to measure. An extreme example is the expectation that a unit's vehicles achieve "zero defects." The only way to achieve such a goal is not to use them! Pressure for zero defects, in fact, produces a perverse sort of cross-training in which an altogether natural tendency of superiors to assume more and more of the duties of those under them provides a superficially acceptable quick-fix, but is actually destructive of team effectiveness. In addition, it soon leads to "burn-out" of intelligent, caring leaders who cannot do the jobs of two or three men indefinitely.

The importance of real cross-training to continuous operations, however, cannot be overemphasized. We consider it likely that entire batteries will be rendered ineffective by the loss from wounds or exhaustion of only a handful of men because they have literally become indispensable by design or default. It will be impossible to survive extended operations if a unit insists upon maintaining the best man for the job in that position at all times. This tendency appears to us to be most common within the Fire Direction Center and on the gun crews. We observed a Field Artillery Digital Automatic Computer (FADAC) operator, for example, drag his crutches and freshly cast leg into the back of an armored personnel carrier with five other soldiers and struggle through a 36-hour battalion ARTEP "because he's far and away the best FADAC operator in the battalion."

None of this is news to any commander, so why should cross-training ever be slighted? The answer lies in current evaluation philosophy and techniques under which a commander is often well-advised to train one man to a high level of proficiency on a task rather than several men to a reasonably high level, even though it is apparent to all that the second course is more appropriate to the demands of combat. We witnessed, for example, the selection as leader of the special weapons convoy for the battalion nuclear surety evaluation the one officer in the battalion who had done it before. This selection took place over the protests of two other battery commanders who argued that they should at least undergo the same training and rehearsal even if they did not formally represent the battalion for evaluation. The point here is not to hold up a particular commander or his staff for criticism. On the contrary, here and throughout the entire period of our study, this commander and his staff responded to the contingencies, the written and unwritten rules of the game, as any sensible person would. The outcome was often not sensible, however, because the present system of rewards in the Army focuses on short-term achievement to such an extent that it not only neglects long-term goals, but often encourages action directly counter to them.

Consider, for example, the experience of a young executive officer from a corps 8-inch battery who chatted with me while serving as a REFORGER umpire. During their most recent field training, he explained, they had undertaken an eight-day exercise of their own devising in preparation for their battalion ARTEP:

> Everyone knows you can make it in 36 hours. You may be screwed up by the time you finish, but you can do it. Eight days is something else, though—so we knew we'd have to devise some sort of shift schedule. It was tough at first, but by the end, we had it down pretty good. In fact, we were so pleased that when it came time for the ARTEP, which we knew would only be 36 hours at the most, we figured, 'Hell, why not do it the way we'd have to do it in real combat, since we've got a system?' What do

you suppose happens? We get gigged for 'lack of enthusiasm,' 'not going all out,' and so forth when the evaluators see a bunch of people asleep.

As a start at reform, elimination of the adversary relationship between tester and tested, and the disproportionate importance attached to very specific and highly predictable tests, would allow for much more imaginative and combat-relevant testing, leading in turn to more rounded, combat-oriented, and morale-boosting training.

In terms of actual leader behavior during continuous operations, both the classic surveys of S. A. Stouffer[13] and the recent experimental studies of the British point to the need for a friendly and relaxed leadership style when dealing with tired soldiers. During Operation Early Call, for example, NCOs reported that quiet reminders and exhortations were more effective than orders, particularly late in the exercise. Tired soldiers tended toward passivity and docility rather than aggressiveness, toward resignation rather than resistance. This tendency held for leaders as well as followers, of course. In perfect harmony with the distinction made earlier between self-paced and forced-paced activities, a few of the junior NCOs abdicated their positions of leadership in favor of personal survival and comfort.[14]

Leaders of small groups during continuous operations may also find helpful several findings from studies of civilian organizations performing under high task load:[15]

- There will be greater deviation from standard procedures and doctrine.
- There will be increased emphasis on priorities (cf. self- versus forced-paced tasks).
- Cross-checking and spot-checking will decrease.
- Communications within the working group will decrease, as will record keeping.
- Communications with "outside" groups and individuals will increase.
- Decisionmaking initially centered on the formal leader will tend to be transferred to the group member with the greatest knowledge and experience if he is not the formal leader. If he is the formal leader, he will be relied on more and more for advice and decisions.
- Interpersonal conflict will decrease (though positive interactions may not increase).
- Attempts to briefly "leave the scene," physically or psychologically, will increase.

It thus becomes clear that the challenges to leaders in the prolonged high-pressure environment of continuous operations are considerable.

Our observations have underlined several aspects of the current leadership "climate" that unquestionably impair the ability of today's Army to perform not only in continuous operations, but indeed in any kind of operations. Foremost among these is the strongly ingrained and widely held belief that mistakes are neither expected nor tolerated. The practical consequences of believing that one's career is at stake every minute of every day are parallel to those of the bodycount mentality referred to earlier. As managers, we find it difficult to measure "taking care of one's men," "esprit de corps," "individual morale," and even "readiness," so instead we measure various quantifiable failings, on the assumption that lack of such failings implies health in the unmeasurable areas. This assumption is simply not true: having few deserters is *not* having high morale, any more than lack of serious illness means being in good shape.

Junior officers and senior NCOs, particularly, see their task as avoiding mistakes rather than learning and growing constantly by trial and error. Leadership cannot be learned merely by teaching our officer corps to concentrate on avoiding easily measured mistakes. For example, it is not "leadership" to cannibalize vehicles awaiting parts to make sure that those to be inspected are letter perfect, or to assure that the installation dining facility "belongs" to a unit not getting its AGI. In fact, this management philosophy, borrowed from industry and commerce (where at least there is a clear-cut, dollar-and-cents product to serve as a counter-balancing positive goal), exerts great pressure to falsify reports, by

omission as well as commission, and stifles initiative, trust, and honest communication. It intimidates commanders and leaders at all levels into usurping duties of subordinates (to the consternation and long-term detriment of both) or shunting more and more work to the ever-dwindling number of "reliable" workers, who finally burn out. The management approach, as opposed to leadership, is also at least in part responsible for the flowering of what might be termed "the hardware store" approach to discipline and training problems: "I get no reward for the extra efforts involved in motivating or training these guys, so why not send them back like any other defective part, and get a brand new one?"

It is no wonder, in such a climate, that officers are ambivalent about that traditionally and theoretically most honored of positions: commander. They see it as something to be endured for the sake of one's career rather than a highlight of that career. Those who have no taste or talent for command feel they must accept it, even seek it, to "remain competitive," while those who are good at it feel they too must move on to other jobs before suffering one fatal mistake and withering on the promotion vine.

MORALE AND SOCIAL SUPPORT SYSTEMS

The "Year of the Soldier" in Europe has quite properly called attention to a myriad of soldier personal problems and resulted in many much-needed corrections. The continued loss of first-term troops at the rate of a battalion a month suggests, however, that it is a difficult job indeed to raise soldier morale with the purely pragmatic problem-solving approach. One reason this is true may be the lack of clarity about the sources of unhappiness, specifically, the failure to distinguish individual or personal morale, which does indeed depend on things like good chow, clean clothes, recreational facilities, and so forth, from group or unit morale, which is a product of membership in a respected unit with confidence in and respect for comrades and leaders.[16] It is the latter type of morale that history suggests is crucial to combat performance.[17] Furthermore, it is important for peacetime performance as well. As L. H. Ingraham puts it:

> Small group membership is crucial to the day-to-day experience of the soldier. He is forced to manage large blocks of time away from his home, family, and friends. That time needs to be filled in the company of other people, as he does not thrive in isolation.[18]

Experiences in past wars as well as in industrial settings has made it obvious that there is much to be gained if the young barracks dweller can find social bonding within his own military work group. There, the young soldier can find a social support group for himself, generated by interpersonal contacts and activities within the same limited and diverse group of other transients who comprise his work group. He does not have much time to achieve group identity, owing to transfers and rotations, nor does he typically possess sophisticated social skills or leisure-time habits. Unfortunately, drug and alcohol use become strong temptations, offering a variety of distinct shared activites and a unique group history that can create a sense of comradeship literally overnight and effortlessly. Perhaps just as unfortunately, the social networks thus formed almost never include all members of a work group, and hardly ever include any significant mixture of ranks. The attitude of distrust which comes to pervade relations between users and non-users is of course maladaptive, and the hypocrisy of often hard-drinking supervisors pursuing users of other drugs is not lost on unit members. Also obvious to all is the seeming impotence of the Army, defeated daily by its most junior personnel in efforts to suppress illicit drug use. Thus, respect for and confidence in the chain of command is not so subtly undermined.

What I am suggesting is that drug use has flourished in the vacuum created by the Army's continuing transformation from "total institution" to "just another job." Very necessary for combat, and in garrison as

well, is a sense of belonging, but belonging to a group that includes both single and married soldiers, junior and senior enlisted men and officers, and perhaps even families, sweethearts, and friends.

Such informal social bonding cannot be accomplished by orders and directives. It must be built as a by-product of activities which fill large blocks of time, involve minimal skill (so that anyone can participate), and comprise intelligent mixes of work and play, duty and recreation. Such an enlarged "family" setting would provide alternative social alliances for soldiers. These activities must be seen not as a troop welfare program, but as an essential part of the unit's mission, a part which may or may not improve readiness by cutting into drug and alcohol abuse, but which will certainly provide the unit with the strongest available insurance against the stress of prolonged combat—loyalty to one another.

CONCLUSIONS

Though this report does not cover all the implications of continuous combat for US planners and policymakers, even for the human factors area alone, it does address four of the most important. We may recapitulate these areas as first considerations for any commander wishing to attack the problem:

- *Sleep for leaders* is by far the most critical factor, owing to the high sensitivity of decisionmaking and other cognitive tasks to fatigue. At present, this fact is simply unacceptable to the vast majority of leaders at battalion and lower levels, at least with regard to themselves.
- *Cross-training* is essential at all levels, command included, if any kind of shift work is going to be possible, or if the unit is going to survive the inevitable losses of key personnel. Neither cross-training nor combat leader development is possible in a "zero defects" environment.
- *Worries about dependents' care* will play a large role in staying power.
- *Unit cohesion*, the extent to which the members see themselves as a unit or team in which teammates cannot let a buddy down, will be a crucial determinant of endurance.

Neither the problem of continuous combat operations nor its solutions are seriously addressed within our Army's present doctrine or training. It is time that we turn our best thinking in this direction.

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The Human Dimension

By Lieutenant Colonel Wm. Edward Slifer

Ten years ago the United States anticipated that in the 1980s it would have force readiness equal to, or superior to, that of the Soviet Union. National policies, resource constraints, shifting priorities and Soviet technological improvements appear to have created a negative gap between our respective force readiness capabilities. As a result, the Army has initiated a large scale modernization program to close the gap and bring the Army to its maximum effectiveness in order to assure victory on the battlefield.

Many factors determine the outcome of battle; one of the major factors is the human dimension. The modernization program is giving increased emphasis on the need to maximize the human capability of our soldiers (i.e., the human dimension). In line with this need, for over a year, the Human Dimension Division, Doctrine and Combat Developments Directorate, Soldier Support Center, has been engaged in developing comprehensive "people" doctrine. The Human Dimension Division is studying some of the more important variables which affect human capability -- unit cohesion, combat stress, and human performance in continuous operations. Test doctrinal literature is being developed in each area.

Unit cohesion is a critical element of readiness, because it acts as a positive motivator in peacetime and as a force multiplier in combat. Data from previous wars validate that cohesive units perform

better than units with less cohesion. For example, battle casualty data from World War II shows that combat stress (neuropsychiatric) casualties in units which were not very cohesive had a devastating effect on the ability of the units to sustain themselves in combat. In 44 days of heavy fighting on the Gothic line, the newly committed 88th and 91st Divisions received approximately 3,600 and 2,700 wounded in action respectively. In addition, they lost 817 and 919, respectively, as a result of combat stress. The percentages of combat stress to wounded in action casualties were 22.7 percent and 34 percent respectively.

The above figures can be compared with even heavier fighting encountered by two very cohesive units. In 28 days of combat at Normandy, the 82d Airborne Division lost 4,197 wounded in action and 238 (only 5.7 percent) as a result of combat stress. The 101st Airborne Division at the Battle of the Bulge, in 43 days, lost 4,992 wounded in action and 102 (only 2.0 percent) to combat stress. These historical examples show that cohesive units withstand the stress of combat much better than units which are not as cohesive.

The Human Dimension Division has a two-pronged effort underway in the area of cohesion. One is to produce a Department of Army Pamphlet, *"Leadership Guide to Assessing and Managing Unit Cohesion."* The other is to produce a follow-on comprehensive doctrinal test field manual on unit cohesion.

The leadership guide is geared to help leaders at company level and below to make their units more cohesive. It is also intended to be of assistance to all leaders. Throughout the guide, the relevance of leadership to the entire process of building cohesion is emphasized.

Contents of the guide include: (a) a general introduction to group characteristics with emphasis on the need for cohesion; (b) differences between formed and interest groups and their implications for influencing individual behavior; (c) stages of unit development and general leadership roles for each stage; (d) knowing personnel, not only as individuals, but also as members of a group (i.e., the unit); (e) understanding the unit socialization process and the significance of values and standards; (f) implications of divergent unit and individual objectives and the necessity for congruence; and (g) the importance of identifying with one's unit and the need to know the positive aspects of the unit's history.

A unique feature of the leadership guide is a summary of questions for leaders to ask which will assist them in assessing unit cohesion. The following is a sample of the questions:

LTC Wm. Edward Slifer has been developing comprehensive "people" doctrine at the Soldier Support Center. (Photo by Shirley K. Stutzman)

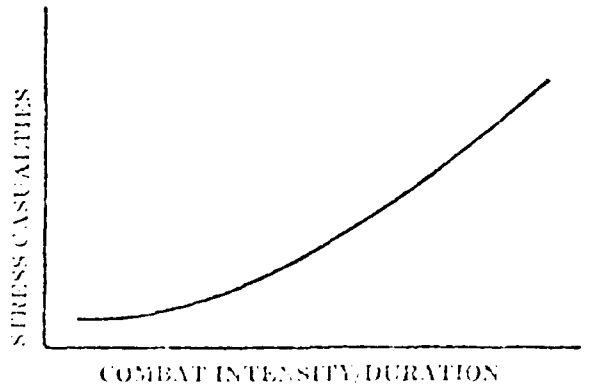
* *Does the unit provide for satisfaction of member needs?*
* *Do unit members know who cares about them?*
* *Do unit members have yardsticks to measure their performance?*
* *Are unit members confident?*
* *Does each sub-unit have sufficient members and other resources to accomplish its mission?*
* *Is unit communication effective?*
* *Do unit members belong to prominent interest sub-groups which support or detract from unit cohesion?*
* *Is each soldier's family made to feel a part of unit life?*

In March, 1980, a Human Dimension Working Group Conference was sponsored by the Soldier Support Center and was attended by sixteen military and civilian behavioral science experts. The conference participants decided that sufficient information and research was available to produce a field manual on unit cohesion. Production of a test field manual is now underway as a joint undertaking by the Walter Reed Army Institute of Research, the Army

Research Institute, ODCSPER and the Soldier Support Center's.

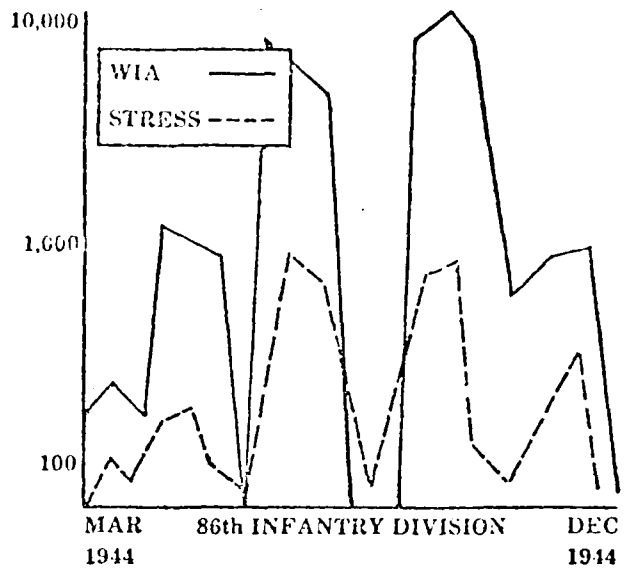
The field manual is being developed from a total systems perspective. It will demonstrate why cohesion is important, what happens if you don't have cohesion, actions that can be taken to get cohesion, and why certain actions work to obtain cohesion. The manual will include a chapter on diagnosis and assessment as well as a list of markers (e.g., sick call rates, Article 15's/courts-martial) to use in order to identify whether a unit is cohesive or in trouble. The manual will also contain a list of cohesion builders for the battalion commander down to the squad leader. Each leadership level is discussed in terms of the types of behavior that will enhance cohesion or operate against it. Emphasis is placed on the idea that cohesion stems from meaningful mission oriented experiences within the unit where the quality of unit performance is fed back to the group, is meaningful to the group, and is a primary means to instill cohesion.

The two most important ingredients of combat stress are physical fatigue and mental stress. Combat stress is a result of prolonged exposure to battle conditions, just as injury and physical disease are results of battle conditions. Both intensity and duration determine how much stress builds up in the soldier. Stress casualties increase when combat intensity increases. Stress casualties also increase the longer troops stay in active combat. The greatest stress results from very intense combat that continues for an extended period.



Combat intensity, duration, and stress casualties.

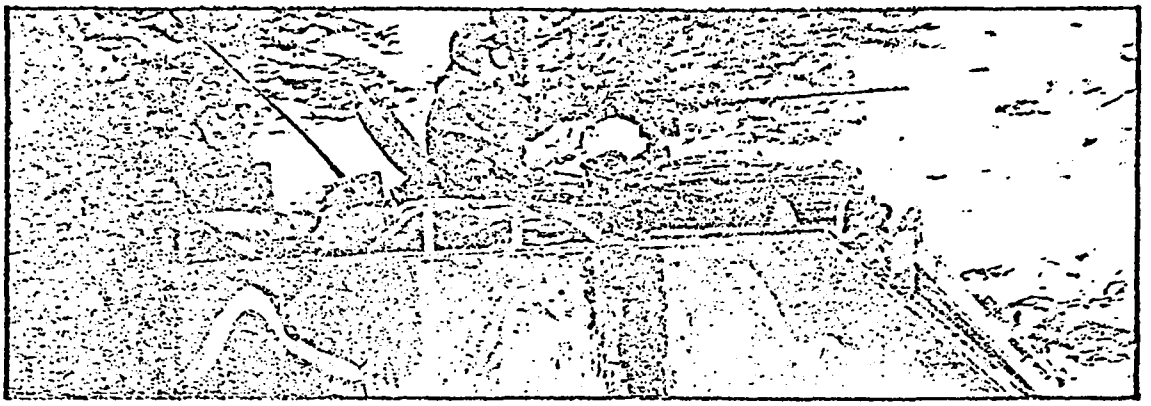
Experience from WW II and Korea demonstrated a clear and reliable relationship between battle intensity and stress casualties. When battle intensity is expressed in terms of the number of persons Wounded In Action (WIA), the relationship may be graphically illustrated as follows:



Combat stress casualties constitute a substantial part of the medical workload. In past wars, it was revealed that there was one combat stress casualty for every four wounded in action -- one for every three wounded during lengthy periods of intense combat. In a war characterized by continuous operations on a high-intensity, integrated battlefield, the relationship of stress casualties to wounded in action is expected to be at least one to three and conceivably even greater. Combat stress is not solely a medical problem. It is also a command problem -- both in terms of numbers lost from duty and reduced performance of duty. It is a command responsibility to take actions to increase the individual soldier's resistance to combat stress and to manage stress in units.

Test Field Manual

The Army Research Institute (ARI), is producing a test field manual, "*Management of Stress in Army Operations*," in a joint ARI-HDD cooperative venture. In the past, leaders have not paid sufficient attention to mental stress. The field manual informs leaders that appropriate methods of coping with and managing stress will reap dividends during combat. Areas of emphasis are on what the individual soldier can do, what the "buddy" can do, and what the leader can do in order



People doctrine emphasizes what the individual soldier can do and what the "buddy" can do to recognize, prevent and cope with combat stress. (Photo by David M. Ryder)

to recognize, prevent, and cope with combat stress.

Victory on the battlefield is the ultimate goal of the Army. To achieve victory with the lowest cost of health and lives, soldiers must be well trained for battle. A significant part of such training must be learning to cope with stress. It cannot be overemphasized that leaders, too, must learn to cope with stress and additionally to manage stress in their units. Utilization of stress coping and managing techniques in combat will help to conserve the fighting strength.

Human Performance in Continuous Operations

The prospects of continuous combat operations in future, intensive warfare, introduce significant changes in Army operations. Unless carefully managed, performance on successive days of continuous operations will be degraded. The degradation becomes more severe as more and more sleep is lost. For any mission involving extended operations without sleep, leaders must know the performance level which can be realistically expected, what aspects of performance are most vulnerable to degradation, and how to manage and control performance degradation.

The March, 1980 Human Dimension Working Group Conference determined that a three-volume research study entitled, *"Human Performance in Continuous Operations,"* was capable of being translated into a test field manual. The Army Research Institute and the Human Dimension Division are engaged in a first-try attempt to translate the research study directly into test doctrine.

The test field manual will serve several needs. Factors governing rates and degrees of progressive performance degradation are explained. Differences in expected effectiveness for various types of combat activity over 120 continuous mission hours are illustrated. Principles for countering and slowing the erosion of human resources are outlined. Suggestions are given for programs to condition units for continuous operations, and for preserving their fighting capabilities during continuous combat. Such information will profit those possessing leadership responsibilities for the planning and management of human performance in combat missions.

The Soldier Support Center efforts represent a modern day approach to modern warfare. The modern Army must integrate technological knowledge of soldier capability and potential. The human dimension force multiplier is to enable the soldier to deal successfully with the stressors of the NBC battlefield and fight effectively.

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Health and High Command: The Pains of Decision

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Dr L'Etang is the Editor of The Practitioner

IN A perfect world the decisions in any Command, high or low, would be painless. Some 30 years of testing and selection for intellectual, physical, psychological and martial fitness should eliminate the faint but pursuing and ensure the promotion of those most fitted for high command. Between 1807 and 1945 the systems employed by the German General Staff tried to forge just such an instrument to pick out those with, to use the title of Colonel T. N. Dupuy's book, *A Genius for War*[1]. No fewer than ten essential contributory factors were listed; selection, examination, specialised training, study of military history, inculcation of initiative, responsibility, technical-tactical perfection, objectivity in analysis, regeneration (by careful recruitment) and leavening (continued instruction).

Certainly the German staff system, which thus ensured relatively painless decision-making, worked smoothly in August 1914 when the German Army, fully extended in the west by the plan that was no longer von Schlieffen's, experienced a crisis on the Eastern Front. As General von Prittwitz, whose 8th Army faced the Russians, wavered between complete withdrawal to the river Vistula or disengagement, General von Hindenburg with General Ludendorff as chief of staff, was sent east to replace him. Without consultation, Ludendorff immediately despatched orders—orders which were identical to those already drafted by Colonel Max Hoffman of the 8th Army staff; a tribute to a rigorous staff training which ensured under pressure an identical, accurate and painless solution to military problems.

But even the most efficient training can be vitiated by human frailty and failure. What Winston Churchill called the HL—

[1] Dupuy, T. N., *A Genius for War*, Macdonald and Jane's, London, 1977.

combination won many victories but, during the supreme crisis in August 1918, Ludendorff's mental and physical health was adversely affected and decision-making became painful if not impossible. Even as early as 26 August 1914 he had to be calmed and supported by Hindenburg and, by 1918, he is variously described as agitated, nervous, depressed, excited, out of control, irascible, lachrymose and on the verge of collapse[2]. All these different moods could be explained by an enlarged and toxic goitre (thyroid gland) which was removed surgically in 1926. He may have been correct in saying that, had the operation been performed years earlier, Germany might have won the war.

Even careful selection and ideal training cannot prevent the development of the pains of decision in an individual who is obsessed with petty detail and whose innate traits of character compel him to explore every aspect of an issue. In war as in civilian life rapid and imperfect decisions have to be taken on the basis of incomplete or contradictory evidence. Field Marshal Friedrich Paulus, nicknamed *Fabius Cunctator* the temporiser, was as much a victim of his own indecisiveness as he was of Hitler's intransigent orders to fight to the end at Stalingrad.[3] Throughout his career Paulus clearly felt compelled to study minutely every possibility, so that it took him hours to issue operational orders. When unexpectedly given a regimental command during the 1920 manoeuvres, the directing staff commented on his lack of decisiveness. Decision must always have been painful and, by the end of 1941, nervous twitching over the right side of his face showed that he had overworked himself to the point of exhaustion. In November 1942 Paulus should have taken the decision to break out of Stalingrad with 6th Army and, in December, obeyed General Manstein's orders to this effect. Apart from his own defects of personality his chief of staff unfortunately exerted an even more undesirable influence; Major-General Arthur Schmidt, stubborn, unadaptable and uncompromising, was the worst possible associate for Paulus.

Indeed, when one or more are gathered together in high command there may be danger rather than safety in numbers. Although it may be against the odds, all too often in dire emergency not one but several decision-makers are severely handicapped. In the disastrous Burma campaign of 1942 the pains of

[2] Parkinson, Roger, *Tormented Warrior: Ludendorff and the Supreme Command*, Hodder and Stoughton, London, 1978.

[3] Von Mellenthin, F. W., *German Generals of World War II*, University of Oklahoma Press, Norman, 1977.

decision must have been exacerbated at no fewer than three levels of command.[4] The Commander-in-Chief, the then General Wavell, who was already exhausted, fell and broke two bones in his back and developed mild cerebral concussion on 10 February. Sir John Smyth attributes the subsequent 'stream of ill-judged and ill-informed directives' to 'the vagaries of a very sick man'. On 16 February the army commander, General Hutton, badly shaken when his Lysander aircraft crashed, looked ghastly 'and was really in no fit state to face the ordeals of the next few days'. Smyth himself, GOC 17th Indian division, debilitated not only by an anal fissure and abscess but also by malaria, was forced to take the much criticised decision to blow the bridge over the Sittang river before the bulk of his troops could be withdrawn.

Painful Personal Relationships

Decision-making is an art as well as a science and it is unwise to ignore inborn or acquired social and psychological traits which can influence personal relationships for better or for worse. It is impossible to ensure that decision-makers are drawn from the same school or regiment and have attitudes and ambitions in common. They may come from different arms of the Service or, to complicate relationships still further, from different Services or different countries. Painful relationships in the Australian High Command in World War II have been examined with commendable objectivity. These arose because the regular officers were trained as staff officers and, compared with officers in the militia, were said to lack the ability and experience to command troops in the field. This organisational iron-curtain may have exacerbated the conflict between General, later Field Marshal, Blamey, the commander-in-chief, who was a militia officer, and General Rowell, a staff-trained regular officer, which began during the Greek campaign in 1941 and led to the latter's removal in New Guinea in 1942. Rowell's 'only failure was his inability to work with a man towards whom he felt only loathing and disgust'.[5]

Not the least of the painful problems of high command are the conflicts which arise between ambitious and aggressive subordinate commanders. At the end of June 1944, victory in the battle of the Philippine Sea (commonly known as the Marianas Turkey Shoot) did not bring peace of mind to Admiral Chester

[4] Smyth, Sir John, *Milestones*, Sidgwick and Jackson, London, 1979.
[5] Horner, D. M., *Crises of Command: Australian Generalship and the Japanese Threat, 1941–43*, Australian National University Press, Canberra, 1978.

Nimitz, the overall commander. General Holland M. Smith, US Marine Corps, relieved General Ralph Smith, US Army, GOC 27 Division, because this last division had become bogged down on Saipan and exposed the flanks of two marine divisions. Lieutenant-General Robert C. Richardson, US Army, commanding General US Army Forces Central Pacific, first abused 'Howling Mad' Smith and then told Vice-Admiral R. Kelly Turner, commanding 5th Amphibious Fleet, that he was not accountable to any officer in the Marianas; 'at that Terrible Turner let loose a blast that caused the visiting general to turn white with anger'. When Richardson complained through other channels Admiral Raymond A. Spruance, commanding 5th Fleet merely said 'that's just Kelly Turner's way' and 'no one takes him seriously'.[6]

General Sir John Wilton, a former chairman of the Australian chiefs of staff committee, has commented on the immense strain placed on commanders who have to work at 'the political–military interface'. The haphazard nature of political and military appointments, when incompatible individuals are intimately associated, can cause inflammatory and painful changes in personal relationships which can render decision-making even more difficult. When the Prime Minister in a democracy also becomes Minister of Defence, military command can be a painful exercise; as in World War II Generals Wavell, Auchinleck, Dill, Brooke—and Paulus *vis à vis* Hitler—found to their cost. Conscious as he may be of unendurable pressure from a Churchill, a Hitler or a Stalin, the commander must also be aware of subtle but no less dangerous pressure from his subordinates. It was said of Major General Richard Sutherland, MacArthur's chief of staff, that he could work on his master 'like Paderewski playing the piano' and bring out in him 'any latent jealousy and envy in his nature'. He had 'a strange control' over MacArthur, knew his failures, foibles and weaknesses and 'could manoeuvre him and play on these characteristics like an expert plucking the strings of a fine violin'[7].

For the allied powers in the second world war it was as well that the Luftwaffe High Command was bedevilled by 'a mosaic of peculiar personalities, many of them possessing character weaknesses which hampered them during times of severe stress and crisis when sober and responsible action was imperative'. Inter-

[6] Potter, E. B., *Nimitz*, Naval Institute Press, Annapolis, 1976.
[7] Horner, D. M., *op. cit.*

departmental rivalries, 'vicious intrigues, and an inordinate amount of currying of favour' led to factions and cliques; those for or against Hitler and Goering, Udet against Milch, Milch against Jeschonnek or vice versa.[8] No doubt this internecine strife was in part responsible for the administrative, strategic, tactical and technical failures, and even for the suicides of Ernst Udet, Chief of Supply and Development, and Hans Jeschonnek, the Chief of Staff, in 1941 and 1943 respectively.

Mood

The mood of any potential commander should (and could be) assessed over his formative years lest the pains of decision become painful to those under command. Fortunately, many who are appointed will have an equable temperament which will enable them to take the rough with the smooth. In considering those whose behaviour deviates from the conventional or so-called normal, the reserved and gloomy individual will attract more criticism than the dramatic, tireless extrovert. The latter in a crisis, alas, may do far more harm when his unfounded optimism leads to rash decisions and his abundant energy to senseless or even destructive activity.

When General MacArthur was virtually the acting Emperor of Japan a journalist reported his restlessness and garrulity and how 'he would pass from serenity to amusement to trembling excitement', his tone of voice 'now quivering with anger and now humming resonantly'[9]. Alas, these verbal pyrotechnics were reflected in his conduct on the battlefield. After the North Korean invasion of the South in June 1950, he swung from jaunty confidence to deep pessimism. As the North Korean and Chinese forces threatened those of the United Nations with defeat later in the same year, responsible officials in Washington were disturbed to find that MacArthur's 'depressive period' was being replaced by a manic reaction, whilst at the end of November he 'plunged from the height of optimism to the bottom of his depressive cycle'. Early in December, Dean Acheson, the Secretary of State, diagnosed MacArthur as being 'in a blue funk, sorry for himself'[10].

Swings of mood are common in creative individuals and should not necessarily be a bar to advancement. General Eisenhower wrote that General Patton 'always lived at one extreme or another of the emotional spectrum. He was either at the top of his form, laughing and full of enthusiasm, or filled with remorse or despondency'[11]. In the excitable phase, decision-making may be painless—and ultimately disastrous; in the depressed phase, it may be painful—and ultimately impossible. This last state may be even worse than the first and can be illustrated by the behaviour of Moshe Dayan who was the Israeli Minister of Defence during the Yom Kippur War in October 1973[12]. He moved in a few days from 'the extreme of complete confidence' about the disposition of the Israeli forces to a state of complete depression and lack of confidence. He spent much of his time in the front line 'frequently creating an air of pessimism around him and giving advice which, had it been taken, could have spelt disaster for the Israeli forces . . .'. Mrs Golda Meir vividly portrayed his mood-swings when she placed the point of her elbow on a table and moved her arm from side to side; 'the great Moshe Dayan . . . one day like this . . . one day like that'. She was made of sterner stuff. She may have been an inflexible (though disorderly) administrator but 'she was strong and adamant and gave the country the powerful leadership it required'.

Exhaustion and Lack of Sleep

Mental and physical exhaustion together with reduced opportunities for sleep are an invariable accompaniment of high endeavour in military, political and commercial life. Conscientious annual reports and promotion boards should help to select those least likely in adverse conditions to suffer undue pain in decision-making. Nevertheless, even the elect are often not in the best shape to deal with emergencies, as is shown by an extract from the diary of Admiral Sir Charles Lambe, written in the winter of 1939 when he was commanding a cruiser; 'Oh God, I suppose it's going to be another of those bloody nights when there is no peace of mind down here on my bunk nor any rest for the body leaning over the after side of the bridge watching the heavy seas breaking into the waists, and imagining things to be worse than they really are in the darkness. It's no use trying to go to sleep now even, while it's still daylight. Every lurch wakes you with foreboding of damage done . . .'[13]

[8] Taber, Harold: *Luftwaffe*, Sidgwick and Jackson Limited, 1979.
[9] Manchester, William, *American Caesar: Douglas MacArthur 1880–1964*, Little, Brown and Company, Boston, 1978.
[10] Acheson, Dean, *Present at the Creation*, Hamish Hamilton, London, 1970.
[11] Eisenhower, Dwight D., *At Ease*, Robert Hale, London, 1968.
[12] Herzog, Chaim, *The Sunday Telegraph*, 18 May 1975.
[13] Warner, Oliver, *Admiral of the Fleet: The Life of Sir Charles Lambe*, Sidgwick and Jackson, London, 1969.

There is no available system of preliminary training which will enable an individual to function normally in the presence of an irresistible desire to rest an overtaxed mind and body. Furthermore, once in this state, not only is the capacity to take decisions impaired but self-judgment is so diminished that the individual, far from resting, drives himself even more inefficiently. It was behaviour of this sort which, in May 1967, came near to ruining the career of General Yitzhak Rabin, the Israeli chief-of-staff. After Israeli intelligence had warned that the Egyptian Army had been put on the alert, Rabin worked a 15- to 20-hour day, during which he smoked 60 to 70 cigarettes and only snatched a few hours sleep. His lack of balance, indecision and the altering of previous decisions created insecurity in those around him. At a news conference on 21 May his stammering, nervousness and incoherence suggested that he had lost his 'nervous stability' whilst on 23 May he appeared to be in a dream-like state and hardly spoke. Rabin became convinced that he had led Israel astray through his mistakes and suggested resignation. Wiser counsels prevailed and, after being given an injection which ensured deep sleep, he was enabled to survive and fight another day[14].

A warning must be issued to those who are tempted to copy the example of wayward youth and take drugs either to prevent the need for sleep, stimulate mental and physical activity, or induce sleep at a chosen time. Pep-pills can cause restlessness, sleeplessness, irritability and hallucinations, and sleeping tablets a deterioration in judgment and decision lasting well into the following morning. Even nasal sprays and inhalants may contain ingredients akin to the chemicals in pep-pills whilst some 'cold cures' produce drowsiness. Travel-sickness remedies in sensitive subjects may cause restlessness, confusion and delusions, and excessive amounts of that old standby, black coffee, can have the same effect.

Stress

It has been suggested that stressful and threatening events are an inescapable part of life, but that alone they do not necessarily harm mind or body. Periods of stress are often associated (in civilian life if not on the battlefield) with excessive eating, drinking and smoking, together with a lack of exercise and sleep. It is

[14] Slater, R., *Rabin of Israel*, Robson Books, London, 1977.

these accompanying factors which may contribute largely to the heart attacks, strokes and intestinal troubles so readily attributed to stress. Many of the factors already discussed—personality, personal relationships, stability or instability, and exhaustion—can obviously make any emergency more stressful and decision-making that much more painful. Command at sea for long periods is particularly exacting and the toll may have contributed to the premature death of Captain F. J. Walker, RN, at the early age of 48 years. For 2½ years he had been actively engaged in the Battle of the Atlantic and by May 1944 intimates were concerned by his physical deterioration. His officers noticed signs of strain and, on one occasion, he failed to appear on the bridge and next day did not remember the call. He died in July 1944 of a stroke.

Fighting is a primeval activity which, by allowing the discharge of dammed-up aggression, may in fact relieve the symptoms and signs of stress. Stress disorders, typified by heart attacks, can be preceded by a long period of ill-health and failing function when the victim forces himself to take on even more exhausting tasks. Other important contributory factors are inter-personal conflict, organisational or domestic changes which threaten alteration in status or employment, and frustration and defeat (sometimes imagined) imposed by superiors or colleagues. With so many factors involved it is difficult to ascribe the precise cause and the actual effect of stress which may be simply an inevitable accompaniment of military command. Nevertheless the list of the 'cardiac commanders' who remained on active service is a distinguished one; General H. H. Arnold (US Army Air Force), General Lauris Norstad (SACEUR) and, on the German side, Generals von Brauchitsch and Guderian. Writing to his wife in August 1941 from the Russian front Guderian questioned how long his heart and nerves could stand the strain and continued:

> Have I not become old? These few weeks have imprinted their marks. The physical exertions and battles of the will make themselves felt. Occasionally I have a tremendous yearning for sleep which I can seldom satisfy. Yet, by and large, I am feeling very fit when something is going on—also quick and able. But as soon as the tension is relaxed comes the relapse.[15]

Guderian was a shrewd prognostician. Dismissed in December 1941 he developed signs of heart disease in March 1942.

These are some recent examples of what might be the painful

[15] Macksey, Kenneth, *Guderian: Creator of the Blitzkrieg*, Stein and Day, New York, 1976.

and fatal accompaniments of high command. On 4 February 1971, Lieutenant-General V. F. Erskine Crum, aged 52 years, was appointed GOC Northern Ireland; 12 days later he was admitted to an intensive care unit because of a heart attack from which he died. In April 1976, General David Elazar, the Israeli Chief of Staff during the 1973 Yom Kippur War, died of a heart attack at the age of 50 years. He had resigned in April 1974 after he had been blamed by an official commission of inquiry for the incorrect assessments and lack of preparedness which had handicapped the Israeli forces. Although it was widely agreed that he had been a scapegoat he died 'broken-hearted' because he was never publicly exonerated.

In an effort to fortify themselves to resist the pains of command and decision, the victims may subject both heart and blood vessels to intolerable stress. General Walter Von Reichenau, for example, despite certain physical disabilities still tried to excel at active sports in his later years and, during the Polish invasion in September 1939, swam across a river to keep up with his forward troops. During the attack on Russia in 1941, he assumed the superhuman task of commanding both Army Group South and 6th Army. While on leave in Berlin in December 1941, he suffered a minor stroke in a restaurant. Despite the Russian sub-zero temperature he continued his cross-country runs and had a second stroke in January 1942. Evacuated to Germany in an aeroplane, he was killed in a crash landing on 17 January.

Extremes of Environment

Psychological and psychomotor tests show that human function and decision-making can be impaired under adverse environmental conditions, such as extremes of temperature or humidity, excessive physical loads or psychological stimuli (input overload), and when mind and body are weakened by the effects of mental and physical illness.

Transport command can now carry a commander in a few hours across several time-zones to areas of climatic extreme, unfamiliar to those used to the more equable surroundings of a temperate zone. With due care about fluid and salt intake, man can make some adjustment to a hot climate but very little to a cold one; the pictures of Paulus and his haggard and shivering generals, taken when they surrendered at Stalingrad, are a warning to all potential invaders of the USSR and Asiatic mainland. But Russia is not always cold and can offer every variety of

unpleasant weather to unwelcome invaders. As Russians and Germans fought in stifling heat in August 1942, it may have been some comfort to the two contestants that Hitler, at his advanced headquarters, was particularly affected; 'this probably contributed to the disagreements and explosions which reached an unprecedented height in the weeks and months which followed.' The hot, continental climate at Vinnitsa, in the Ukraine, was responsible for his 'unbearable irritability' and literally went to his head.[16] But if extremes of heat and cold are obvious, the insidious effects of the now fashionable jet-lag are not. Those who go straight to the conference room and take decisions after a transoceanic or transcontinental flight should be restrained. It is not just a matter of the sleep that has been lost or the longer working day to be endured because of the time-zone changes. The complicated 24-hour biochemical cycles of the body are now out of phase with local time and, far more important than the bodily discomfort, simple psychological or psychomotor tests will reveal an impairment of intellectual function and powers of decision-making.

Climatic extremes will also expose the commander and his troops to what are euphemistically called exotic diseases. Apart from the effects of any illness, particularly if accompanied by fever, on psychomotor efficiency the drugs used in treatment may have undesirable effects. Exhausted as he was at the end of the Abyssinian campaign in 1941 Orde Wingate may have been driven to attempt suicide not by bitterness and frustration, not by the attack of malaria, but possibly by his incorrect self-medication with mepacrine tablets which can cause hallucinations and confusion. No infectious fever (not even influenza) should be dismissed for, even with the antibiotics now available which reduce temperature, mental and physical weakness may persist. Before his last campaign Wingate contracted typhoid fever at a time when good nursing was the only treatment. He returned to operation planning in late November 1943 but wrote to his wife in January 1944:

> I sometimes think my typhoid has deprived me of my mental force. I have lost some of the intellectual acuteness and force[17].

The demands of war on land, at sea and in the air expose the decision-maker to unprecedented, even unknown, environmental hazards, although he will still receive no mercy if he fails.

[16] Kerr, Walter, *The Secret of Stalingrad*, Macdonald and Jane's, London, 1979.
[17] Sykes, Christopher, *Orde Wingate*, Collins, London, 1959.

General B. M. Kaul, Chief of the General Staff, Indian Army in 1962, was yet another general who, some years after premature retirement, may have died of a 'broken heart'. Ordered to resist the Chinese advance into the North East Frontier Agency in October 1962 he noticed pain in the chest and difficulty in breathing after he had inspected the Dholar post, 12,000 feet above sea level. Later he was flown back to New Delhi for medical treatment but returned to the mountains on 28 October. Kaul later denied that his sudden illness and virtual unfitness for command were responsible for the later defeats which compelled India to agree to a cease fire. Nevertheless one critic maintained that IV Corps was commanded by 'an embittered man, mentally disturbed and physically unfit—still unrecovered from a grave ailment . . .'[18] Like many of his unfortunate troops Kaul presumably had pulmonary oedema of high altitude (fluid on the lungs), a condition that was then not widely recognised. Without sufficient acclimatisation the intake of oxygen and the expiration of waste gases are hindered because the lungs become waterlogged. Conventional standards of fitness may not protect the human body against the quirks of Nature.

Painless Decision-Making

Is there any way of preventing or curing the pains of decision-making? General Omar Bradley makes it seem easy when he writes that successful generalship needs good judgment, self-confidence, powers of leadership and boldness. Field Marshal Slim listed six somewhat similar essentials for command: willpower; judgment; flexibility of mind; knowledge; integrity; and moral and physical courage. Judgment is an important factor in decision-making including as it does an ability to assess not only military situations but, possibly more important, men. Clearly, judgment *per se* is influenced by the presence or absence of Slim's other essentials and, as he emphasised, willpower may lead to obstinacy and flexibility to vacillation. He also warned that a commander must often act in haste on the basis of incomplete and often inaccurate information. Neither Bradley nor Slim mention a point stressed by Admiral of the Fleet Lord Chatfield: that, in the formative years, opportunities involving risk must be given so that potential commanders learn not only how mistakes are made but, more important, how they can be either avoided or corrected.

[18] Dalvi, J. P., *Himalayan Blunder*, Thacker and Co, Bombay, 1969.

There is much in common about decision-making in the course of both military and medical emergencies. It has been said that an experienced doctor is one who has made every mistake and therefore cannot make any more. In medicine as in war, mistakes in decision-making can stem from over-confidence, hasty diagnosis or careless examination of the patient or evidence. A list of diagnostic don'ts for doctors might well apply to military diagnosis, and observance of these salutary instructions could ease the pains of military as well as medical decision-making.

1. Don't be too clever and make big deductions from too little evidence.	(*Tirpitz* is at sea and can attack PQ 17.)
2. Don't diagnose rarities.	(Hitler—or any other foreign leader—is mentally disturbed.)
3. Don't be in too much of a hurry.	('Action this day'—Churchill.)
4. Don't be faddy or fashionable.	('I don't think it is wise to abolish the lance'—Haig.)
5. Don't be too cocksure.	(The Ardennes is tank-proof.)
6. Don't be biased.	(Japanese pilots are inferior because their vision is poor.)

Admirals, generals, air marshals and doctors with these innate or acquired diagnostic skills are the best investments for the future. But the ability to diagnose is not enough. The decisions which are taken by a commander in the heat of battle, or by a surgeon during a hazardous intracranial, cardiac or abdominal operation, are far more difficult than those taken under less stressful conditions by a staff officer at a headquarters or by a laboratory worker not confronted with the pressing immediacy of life and death. Throughout his career a surgeon's technical skill, mental and physical stamina, and diagnostic ability are tested by day and by night. In contrast, the fighting man and future leader may be forced to spend most of his professional life in administration, planning instruction and training. For this type of work, which may bring to the fore the patient, persistent, careful plodder, the war leader, in Chatfield's view, 'has often neither aptitude nor inclination'. He maintained that in peace,

senior officers may be promoted 'who are not possessed of the vital personal qualities that will cope with the strain of war'[19].

Those who complete confidential reports or sit on promotion boards may have to take some painful decisions about seemingly admirable and dedicated officers. In the long-term this may reduce the incidence of pain in the selected decision-makers and the painful consequences of wrong decisions, taken by the wrong man, in the wrong place, at the wrong time.

Painful Decision-Making

Decisions so often have to be made under mental or physical stress which can be uncomfortable or even painful both to experience and witness in others. In a review entitled, 'Indicators of Stress in Policymakers during Foreign Policy Crises', Margaret G. Hermann[20] lists some of the signs which must be widely known either because of personal suffering or from the observation of other victims. For ease of diagnosis she has tabulated the diagnostic pointers: flustered, repetitive, incoherent, corrected, rapid or high-pitched speech; eye-blinking, head scratching, ring twiddling or other repetitive mannerisms ('the twitch'); discomfort, irritability and bodily rigidity; the furrowed brow or, paradoxically, the forced smile.

Stress reactions are peculiar to each individual, but it is the internal psychological rather than the external physical reactions which may add to the discomfort or pains of decision-making. Based on Margaret Hermann's classification, stress may disrupt decision-making in ways which are both painful and dangerous. Because stress can prompt action 'to eliminate or reduce the threat', it can compel the decision-maker to concentrate on one single response to the exclusion of acceptable alternatives. Stress can also lead to a facile oversimplification of 'enemies' and their motives, so that they are regarded as more hostile and effective than they really are, and to a preoccupation with the immediate so that middle- or long-term consequences are not considered. The effects of stress are insidious and rapidly can undermine the sophisticated patterns of thought and judgment which have been painfully learned over a professional lifetime. There may also be a tendency to perceive false similarities between the present and certain past events so that bygone actions may inappropriately be

[19] Chatfield, Lord, *The Navy and Defence*, Vol I, Heinemann, London, 1942.
[20] Hermann, Margaret G., *Political Psychology*, I.I.

copied or rejected; a declining sense of responsibility avoids the odium of failure and makes aggression and hostility less unacceptable; finally the tendency to confine consultation to supporters and sycophants leads to the limitations of 'group think'.

These theoretical and academic concepts about foreign policy decisions advanced by Margaret Hermann are not so far removed from the pragmatic and utilitarian approach of Bradley, Slim and Chatfield. There is already in military circles a harsh weeding process which arbitrarily selects those more likely under the stress of an emergency to be right rather than wrong. An explanation of the causes of painful decision-making, and correct training, could do much to improve the performance of those, so affected by stress, who are more likely to be wrong than right.

A CONTINUOUS OPERATIONS PERSPECTIVE

The continuous operations battlefield may be highly mobile and impose stresses on the soldier which were not inherent in earlier battles. One point of view is presented in this regard which supports contentions favoring full consideration of the psychological conditioning required for enhancing soldier performance.

(Excerpted from a study by J.J. Emanski, Jr.)

One Perspective About Continuous Land Operations

The Soviets have addressed the continuous land operation problem and have made it the keystone of their doctrine. There are strong indications that the equipment is in the hands of their operational forces to implement the concept and that their procedures and doctrine consider continuous operations (1) (2) (3).

The advantages to the Soviets of a continuous offensive are:

- disruption of mobilization of NATO allies
- weakening the resolve of uncommitted nations
- deep penetration and confusion makes the employment of nuclear weapons by the defender more difficult
- reinforcements from the United States cannot arrive in less than eight weeks
- only a relatively few light forces can be transported by air
- the war may be over and done before a nuclear decision is made.

One factor that obscures perception of the powerful combat leverage implicit in continuous combat is the conviction that it is simply an evolutionary step in the progression and difficulty beyond night combat (4). Accordingly, it is reasoned that attention needs to be directed to night operations and the capability for continuous operations will follow (5). Consequently, even gaining the understanding of the enormous impact that continuous land combat will have on every aspect of land combat and support of land combat is deferred or discounted while attention is directed to night operations.

Another factor that may contribute to minimizing the Soviet mechanized combat doctrine of continuous land combat is the emphasis and dependence on cost-effectiveness analysis. Largely, these become elaborate models directed ultimately to a figure of merit that is black or white--and exchange ratio, or attrition per dollar expended, or so many weapons of this kind is equivalent to so many of that. Analytic models and even war gaming are attrition dependent. Assumed equipment superiority as well as numbers and doctrinal concepts such as force ratios for breakthrough--six-to-one attacker to defender desired, three-to-one minimum (FM 100-5)--control the outcome. These analytic methods do not and cannot incorporate military psychological effects. Such effects are essentially ignored and mechanistic effects assumed to dominate. It is the other way round.

In the classic example of continuous land combat, the German Blitzkrieg in May, 1940, none of these criteria were met. Had these analytic means and assumptions been applied, the French positional defense (6) (which parallels the present day forward defense) would have stopped the German forces without question. Instead of six-to-one or even three-to-one, the German forces were numerically inferior. Instead of being technically superior, as is commonly believed, the German equipment was inferior. The German tanks were deficient in armor and in firepower as compared to the French or the British.

What then was the difference? "The Battle of France is one of history's most striking examples of the decisive effect of a new idea, carried out by a dynamic executant (Guderian)" (7). The military psychological impact of what Guderian recognized and implemented in his continuous offensive to the channel ports was presented by Colonel Ardant duPicq in his book "Battle Studies," regarded by students of warfare as a classic (8). Ardant duPicq's fundamental theme was that the character and the nature of man has not changed from ancient to modern times. He wrote: "Battle is the final objective of armies and man is the fundamental instrument in battle whose elements, character, energies, sentiments, fears, desires, and instincts are stronger than all abstract rules and foolish theories. War is still more an art than a science." Other advanced military thinkers--Fuller, Guderian, Patton, Tukhachevsky, Mahan--arrived at the same conclusions and combat principles. These are embodied in and become part of the definition of continuous land combat.

Ardant duPicq observed that the less mobile the troops, the deadlier are the battles. This, of course, underscores the conclusions of the Soviet study of battle and is the fundamental reason for their doctrine of the continuous offensive. This effect can also be seen in the World War II Blitzkrieg where casualties and damage on both sides were light when contrasted with the meat-grinder losses of World War I trench warfare. It also puts to question the assumption of staggering losses and material damage that would paralyze both sides in a NATO/Warsaw Pact war. The doubtful and dangerious conclusion is reached that therefore, it, will not happen.

J. F. C. Fuller characterized the objective of the continuous mechanized offensive as follows: "Not to kill but to move; not to move to kill but to move to terrify, to bewilder, to perplex, to cause consternation, doubt and confusion in the rear of the enemy, which rumor would magnify until panic became monstrous. In short, its aim was to paralyse not only the enemy's command but his government and paralysation would be in direct proportion to velocity" (9).

Have the Soviets missed this point on the impact of mobility and maintaining an unremitting attack pace? Marshal Savkin asserted that, based on studies of combat in World War II, "The rates of advance and troop losses...were inversely proportional. An analysis of the size of losses and expenditure of supplies in nine operations of the Great Patriotic War attests that in attack with a tempo of 20-50km per day the overall losses in personnel were a little over three times less and in tanks were

uncertain about their flank"); insertion of heliborne troops behind the enemy to capture choke points and prevent entry of a retreating force into a city; and finally to underscore the Soviet emphasis on the offensive: "With equal or inferior power of destruction, he will win who has the resolution of advance, who by his formations and maneuvers can threaten his adversary with a new phase of material action." In the context of tomorrow's battlefield this is continuous land combat.

In reaching a definition or an understanding of the character of continuous land combat there is, beyond the assumption of the viability of a positional or static war of attrition, the assumption of the enemy as a "mirror-image" of one's own capabilities and procedures. For example, when informed by M. Renaud, the French Prime Minister, on May 15 that Guderian's Panzer forces had crossed the Meuse and breached the defenses at Sedan and that France was lost, Winston Churchill replied, "All experience shows that the offensive will come to an end after awhile. ...After five or six days they have to halt for supplies, and the opportunity for counter-attack is presented." Certainly, Churchill went on, "this is what we had always seen in the past and what we ought to have seen now" (11).

The mirror-image assumption was also made by General Doumine, the French Army Chief of Staff: "Crediting the enemy with our own procedure, we had imagined that they would not attempt the passage of the Meuse until after they had brought up ample artillery: the five or six days necessary for that would have easily given us time to reinforce."

"The issue (of the Panzer's stunningly effective continuous offensive) turned on the time factor at stage after stage. The French counter movements were too slow to catch up with the changing situation" (12). "It is clear that Guderian and his tankmen pulled the German Army along after them, and thereby produced the most sweeping victory in modern history" (13).

Continuous unremmitting pressure with no delay for natural or man emplaced obstacles is the Soviet doctrine of continuous land combat. Soviet river and obstacle crossing doctrine embodied in continuous combat is stated this way: "Contemporary offensive operations bear a decisive character and are developed to a great depth and at high tempos. A halt by troops in the course of an attack is fraught with great danger. "An assault crossing from the march meets to the fullest extent the character of offensive operations conducted with a decisive goal to a great depth and at high rates." The capability to do this was demonstrated in the 1967 Dnieper River exercise (as was the capability to lay pipe at the extremely fast pace of the attack) (14). These operational procedures and equipments were shown to NATO observers in the Soviet-Warsaw Pact exercises KAVKAZ, SEVER, and SHCHIT in 1976 (15). The river was in flood stage, not a practice set-piece. It was crossed from the march in record time.

Guderian's continuous mechanized offensive was vulnerable because the supporting German infantry, while categorized as motorized, filled in behind the Panzer drive at a heroic forced march pace but largely on foot. The Soviet armies no longer have foot soldiers. Their infantry moves at the pace of the armor in combat vehicles. The BMP-76 PB infantry fighting

almost 1.5 times less than with a tempo of advance of 4-10km per day." He goes on to illustrate that rates of advance have an even greater effect on the specific consumption of supplies per 100 km of troop advance..."with high rates of advance of tank armies the specific consumption of ammunition was decreased by six times, and that of diesel fuel by three times"(10).

Ardant duPicq observed that modern battle formations are spread out and widely dispersed. Lost is the comfort and strength that man gained when he was part of an infantry battle formation. Even though the combat unit contains many men, relatively speaking, they feel isolated, and are prey to the instincts of primitive man. This is likely to the the frame of mind of separated tank-killing teams. He also concluded that "physical exhaustion determined by the nervous tension of the soldier, increased in surprising proportion according to the invisibility of the adversary." Further he stated, "Collective man, a disciplined body of troops formed in tactical battle order, is invincible against an undiciplined body of troops. But against a similarly disciplined body he becomes again primitive man. He flees before a greater force of destruction when he sees it or when he foresees it. Nothing is changed in the heart of man. Discipline keeps enemies face-to-face a little longer, but cannot supplant the instinct for self-preservation that goes with it."

This is precisely what happened when the French positional concepts of defense faced the German Blitzkrieg. The French defense was predicated on small tank-killing teams. These were sited in depth in advantageous terrain. The German tanks were to be channeled into killing zones, then bled white by the infantry tank-killing teams. That doctrine failed for the reasons that Ardant duPicq said that it would: "Man could not accept that much terror." It was not a weapon deficiency. The French high velocity antitank gun was capable of killing the contemporary tank. On paper and in theory the German Panzer formations should have been defeated. The mechanistic and attritional effects did not prevail; the psychological impact on human performance of a war of maneuver did.

Ardant duPicq also established that small groups--even relatively large combat units--that are separated and not under direct supervision and control of high echelons will behave in accordance with the basic instincts of man. Since Ardant duPicq established in his study of battle that the nature of man in combat does not change, armor defense concepts predicated on selfish courage on the part of infantry guided-missile teams may also fail should they have to face armor attacks and breakthroughs exploiting shock, noise, chaos, and violent assault.

If all of the above is considered in the context of the continuous offensive that is projected by the Soviets, the reasoning behind the Soviet doctrine of the continuous offensive aligns with the lessons taught by duPicq in "Battle Studies:" Probing of weakness, then executing the daring thrust; once penetration is achieved, maintain the momentum; avoid frontal attack; exploit the meeting engagement; make maximum use of surprise (Ardant dePicq asserts that a combat unit surprised will flee); prosecute the pursuit phase relentlessly and on a parallel axis (Ardant duPicq: "even a superior force in good position will be routed if they feel

vehicle was fully operational in 1967 and an improved version is already in inventory (16). It must be observed in this discussion of the definition of continuous land combat that the tank is not central to modern combat as it has been conceived in Soviet military thought and tested in their exercises which are as close to combat as you can get. The infantry combat vehicle is. This is a most important factor in considering human performance in continuous operations. While the strengths of the Soviet tank divisions have remained relatively static, the strengths of the Motorized Rifle Division has grown enormously and is now equal (or superior) in firepower to the strongest U.S. mechanized division deployed in Europe. Since 1956, the Soviet Army has added 30 divisions to its order of battle, 90 percent of them being motorized rifle.

FOOTNOTES

(1) To cite but a few "milestone" examples: A. A. Siderenko, "The Offensive," Moscow, 1970; V. Ye. Savkin, "The Basic Principles of Operational Art and Tactics," Moscow, 1971; V.G. Reznichenko, "Tactics (The Officer's Library)," Moscow, 1967; V.D. Sokolovskiy, "Soviet Military Strategy," Moscow, 1968 (original publication now in its third edition).

(2) The Soviet ribbon bridging equipment is second to none so there is no delay at river crossings. The Soviet BMP-76 PB is considered by many authorities to be the best combat vehicle in the world. It allows troops to fight mounted and survive in a nuclear and chemical environment (Sokolovskiy). There is no counterpart in the U.S. Army; Soviet logistics and support equipment is without equal--semi-automatic pipe layers, tank transporters, forward repair, and medical vans.

(3) Alistair Horne, "To Lose a Battle: France 1940," Little Brown, Boston, 1969.

(4) Observation made by MG Morris Brady, Deputy Chief of Staff for Operations, REDCOM, September, 1978.

(5) A conclusion of the Night Operations Conference convened by TRADOC as reported in "Concept Paper on Night Operations," ACN: 22722, United States Combined Arms Center, Fort Leavenworth, Kansas, August, 1975.

(6) Major Robert A. Doughty, "The French Antitank Doctrine, 1940: The Antidote That Failed," Military Review, May 1976.

(7) B.H. Liddell Hart, "History of the Second World War," Putnam, 1971.

(8) Colonel Ardant duPicq, "Battle Studies, Ancient and Modern Battle," MacMillan Company, 1921.

(9) J.F.C. Fuller, "The Conduct of War; 1789-1961," Rutgers University Press, New Brunswick, N.J., 1969, pp. 256-257.

(10) V. Ye Savkin, "The Basic Principles of Operational Art and Tactics (A Soviet View)," Moscow, 1972, p. 136.

(11) Winston S. Churchill, "Their Finest Hour," Houghton Mifflin, Boston, 1949, p.42.

(12) op, cit, Liddell Hart, p. 73.

(13) ibid.

(14) A.A. Siderenko, "The Offensive," Moscow, 1970.

(15) Defense Intelligence Report DDI-1100-159-77, "Soviet-Warsaw Pact Exercise-1976 KAVKAZ-SEVER-SHCHIT-76," April, 1977, unclas.

(16) International Defense Review, September 19, 1978, p. 1375.

(17) FM 100-5 Operations, Headquarters, Department of the Army, 15 December, 1975, unclas.

(18) ibid.

(19) John Keegan, "The Face of Battle," The Viking Press, New York, 1976, pp. 303-304.

(20) For an imaginative but no impossible scenario, see Lieutenant Colonel Clayton A. Pratt, U.S. Army, "The Benelux and Northern German Plains Avenue of Approach," Military Review, June, 1978.

(21) Major Frederick I. Manning, U.S. Army Medical Research Unit Europe, "Human Factors in Sustaining High Rates of Artillery Fire (Final Report)."

PROJECTED EFFECTIVENESS (E) FOR CRITICAL COMBAT TASKS

The succeeding tables of E -- a retained proportion (percentage) of initial combat effectiveness -- were derived from a comprehensive review and analysis of diverse scientific information. Various adverse factors are inherent in, or generated by continuous operations that depress the level of certain critical abilities for accomplishing important combat tasks. The number and degree of these impacts on the tasks was assessed. E was then calculated in a mathematical synthesis (model) of the impacting factors, the abilities, how they relate to each other, and similar matters. The model projects the average level of performance to be expected in specific tasks, or in a given duty position under specified circumstances. E can be calculated not only for a specific task (as in succeeding tables), but for that task within the context of a particular combat mission. E can also be calculated for groups such as maneuver teams, squads, platoons, artillery gun crews, and the like.

In the succeeding tables, E is the proportion of the initial effectiveness that will be retained at the end of each successive (24 hour) day of continuous combat. The decimal point has been omitted. E lies between 0 (zero) and 1.00. When E=1.00 (or, in the table, 100), the level of performance is the level at the start of combat operations, or equivalent to standards achieved in recent ARTEP evaluations. When E reaches 0 (zero) the soldier can no longer achieve the task's goals even on repeated attempts; his combat effectiveness has been totally eroded.

In the succeeding tables, the task numbers refer to the numbers in the lists of important combat tasks. "Day" (in left margin) refers to the <u>end</u> of the first through fifth day (24th through 120th hour) of unrelieved, continuous combat. For example, at the end of the first day (24th hour) of continuous combat operations, the Gunner/Carrier Team Leader of a mechanized infantry platoon is projected to retain only 72 percent of the effectiveness with which he fired from bounding vehicle (Task No. 1) at the start of the very first hour of combat operations.

Projected Effectiveness (E) for Critical Combat Taskes: Mechanized Infantry

Gunner/Carrier Team Leader

Task Number*

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	72	75	87	92	100	67	80	92	73	85	55	74	79	61	90	82	97
2	52	56	76	85	100	45	64	84	53	72	30	55	62	38	81	67	95
3	37	42	67	78	100	30	51	78	38	61	17	40	49	23	73	55	92
4	27	32	58	72	100	20	41	71	28	52	09	30	38	14	65	45	89
5	19	24	51	66	100	13	33	65	20	44	05	22	30	09	59	37	87

Maneuver Team Member

Task Number*

Day	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	88	74	78	83	88	95	88	74	85	100	90	90	83	95	85
2	77	55	61	68	77	90	77	55	73	100	82	81	69	90	72
3	67	41	48	56	67	86	67	41	62	100	74	73	57	86	62
4	59	30	37	47	59	82	59	30	53	100	67	65	47	82	52
5	52	23	29	38	52	78	52	22	46	100	60	59	39	78	45

* See task list which follows.

Squad Leader

Task Number*

Day	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	4
1	85	92	87	67	70	95	36	55	39	68	63	28	74	87	74	90	8
2	72	85	76	45	49	90	13	31	15	46	40	08	54	76	55	81	6
3	61	78	67	30	34	85	05	17	06	32	25	02	40	66	41	73	5
4	52	72	58	20	24	81	02	09	02	21	16	01	29	57	31	65	4
5	44	66	51	14	16	77	01	05	01	15	10	00	22	50	23	59	3

Platoon Leader

Task Number*

Day	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
1	77	85	97	82	53	97	56	67	89	85	66	72	94	75	76	97	86
2	59	73	95	68	28	95	31	45	80	72	43	52	89	56	57	94	75
3	46	62	92	56	15	92	17	30	71	60	28	37	84	42	43	91	65
4	35	53	89	46	08	89	10	20	64	51	19	27	80	31	33	88	56
5	27	45	87	38	04	87	05	13	57	43	12	19	75	23	25	85	48

* See task list which follows.

Platoon Leader (Cont.)

Task Number*

Day	67	68	69	70	71	72	73	74	75	76
1	97	60	47	97	83	85	74	85	92	74
2	95	36	22	95	69	72	55	72	85	54
3	92	22	10	92	57	61	41	60	78	40
4	89	13	05	89	47	52	31	51	72	29
5	87	08	02	87	39	44	23	43	66	22

Projected Effectiveness (E) for Critical Combat Tasks: Armor

Tank Platoon Leader

Task Number*

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	92	90	78	80	82	78	82	97	100	97	100	89	89	68	85	87	87
2	85	81	60	64	68	60	68	95	100	95	100	80	80	46	72	76	76
3	78	73	47	51	56	47	56	92	100	92	100	71	71	31	61	66	66
4	72	65	36	41	46	36	46	89	100	89	100	64	64	21	52	57	57
5	66	59	28	33	38	28	38	87	100	87	100	57	57	14	44	50	50

* See task list which follows.

Tank Platoon Leader (Cont.)

Task Number*

Day	18	19	20	21	22	23	24	25	26
1	82	97	100	94	76	85	61	80	95
2	68	95	100	89	58	72	37	64	90
3	56	92	100	84	44	61	22	51	85
4	46	89	100	79	33	52	14	41	81
5	38	87	100	75	25	44	08	32	77

Tank Commander

Task Number*

Day	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
1	97	94	92	92	100	87	90	95	78	97	97	94	76	81	97
2	95	89	84	84	100	76	80	90	61	95	95	89	58	65	95
3	92	84	77	77	100	66	72	85	47	92	92	84	44	53	92
4	89	80	71	70	100	57	64	81	37	89	89	79	33	43	89
5	87	75	65	64	100	50	58	77	29	87	87	75	25	35	87

* See task list which follows.

Tank Gunner

Task Number*

Day	42	43	44	45	46
1	94	94	100	100	94
2	89	89	100	100	89
3	84	84	100	100	84
4	79	79	100	100	79
5	75	75	100	100	75

Tank Loader

Task Number*

Day	47	48	49	50	51	52	53	54	55	56	57	58
1	100	100	100	100	100	100	100	100	100	97	97	100
2	100	100	100	100	100	100	100	100	100	95	95	100
3	100	100	100	100	100	100	100	100	100	92	92	100
4	100	100	100	100	100	100	100	100	100	89	89	100
5	100	100	100	100	100	100	100	100	100	87	87	100

* See task list which follows.

Projected Effectiveness (E) for Critical Combat Tasks: FIST

Chief

Task Number*

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	94	90	95	95	84	94	85	80	87	50	61	85	87	50	69	64	95
2	89	81	90	90	71	89	72	65	75	25	37	73	75	25	47	41	90
3	84	73	85	85	60	84	61	52	65	12	23	62	65	12	32	27	85
4	80	65	81	81	51	79	52	42	56	06	14	53	57	06	22	17	81
5	75	59	77	77	43	75	44	34	49	03	08	45	49	03	15	11	77

Chief (Cont.)

Task Number*

Day	18	19	20	21	22	23	24	25	26	27	28	29
1	97	89	48	83	55	73	87	60	32	90	100	92
2	95	80	23	69	31	60	76	37	10	82	100	84
3	92	71	11	57	17	47	67	22	03	74	100	78
4	89	64	05	47	09	36	58	13	01	67	100	71
5	87	57	03	39	05	28	51	08	00	60	100	65

* See task list which follows.

Forward Observer

Task Number*

Day	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
1	94	92	95	85	100	69	85	80	76	66	78	78	61	85	80	50	83
2	89	84	90	73	100	48	72	65	58	44	61	61	37	73	64	25	69
3	84	78	85	62	100	34	61	52	44	29	48	48	23	62	51	12	57
4	30	71	81	53	100	23	52	42	34	19	37	37	14	53	41	06	47
5	75	65	77	45	100	16	44	34	26	13	29	29	08	45	32	03	39

Forward Observer (Cont.)

Task Number*

Day	47	48	49	50	51	52	53	54	55	56
1	60	48	72	54	78	87	60	32	90	92
2	36	23	53	29	60	76	37	10	82	84
3	22	11	38	15	47	67	22	03	74	78
4	13	05	28	08	36	58	13	01	67	71
5	08	03	20	04	28	51	08	00	60	65

* See task list which follows.

Fire Support NCO

Task Number*

Day	57	58
1	97	97
2	95	95
3	92	92
4	89	89
5	87	87

Radio Telephone Operator

Task Number*

Day	59
1	94
2	89
3	84
4	80
5	75

* See task list which follows.

Projected Effectiveness (E) for Critical Combat Tasks: Artillery

Battery Executive Officer

Task Number*

Day	1	2	3	4	5	6
1	90	78	87	52	92	87
2	80	61	76	27	85	76
3	72	48	66	14	78	67
4	64	37	57	07	72	58
5	58	29	50	04	67	51

Howitzer Section Chief

Task Number*

Day	7	8	9	10	11	12	13	14	15	16	17
1	97	90	70	74	85	97	97	97	74	72	79
2	95	81	49	56	72	95	95	95	56	52	62
3	92	73	34	41	60	92	92	92	41	37	49
4	89	65	24	31	51	89	89	89	31	27	39
5	87	59	17	23	43	87	87	87	23	19	31

* See task list which follows.

155mm Gunner

Task Number*

Day	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	78	90	74	90	83	83	87	83	85	89	83	92	76	84	77	77	74
2	61	81	55	81	68	68	75	68	72	79	68	84	58	71	59	59	55
3	48	73	41	73	56	56	65	56	61	71	56	77	44	59	45	45	41
4	37	65	30	65	46	46	56	46	52	63	46	71	34	50	35	35	30
5	29	59	23	59	38	38	49	38	44	56	38	65	26	42	27	27	23

155mm Crew Member

Task Number*

Day	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1	100	100	100	100	100	90	97	94	90	100	97	100	94	85
2	100	100	100	100	100	81	95	89	81	100	95	100	89	72
3	100	100	100	100	100	73	92	84	73	100	92	100	84	61
4	100	100	100	100	100	65	89	80	65	100	89	100	80	52
5	100	100	100	100	100	59	87	75	59	100	87	100	75	44

* See task list which follows.

CRITICAL TASK LIST

1. Mechanized Infantry

Gunner/Carrier Team Leader

1. Fire from bounding vehicle
2. Overwatch bounding vehicle
3. Fire to protect bounding vehicle
4. Overwatch dismount
5. Fire .50 Cal at areas
6. Coordinate firing with other vehicles and dismounted elements
7. Maintain knowledge of the squad's location
8. Communicate with PL
9. Detect enemy movement
10. Determine need to relocate
11. Establish revised TRPs plus range cards
12. Direct relocation or repositioning
13. Reposition to allow other SWs to fire as needed
14. Cover disengaging squads
15. Maintain concealed disengagement
16. Fire to protect regrouping
17. Report vehicle readiness to SL

Maneuver Team Member

18. Check condition of weapons
19. Detect targets in exposed position from bounding vehicle
20. Fire weapons from bounding vehicle
21. Plan fire effective positions
22. Coordinate weapons locations
23. Mark routes between possible positions
24. Identify TRPs
25. Plan fire cover for possible relocations
26. Fire on targets
27. Fire at areas
28. Fire with NVDs
29. Move rapidly to new positions via marked routes
30. Fire while relocating
31. Move to assembly area
32. Fire to cover move to assembly area

Squad Leader

33. Observe terrain for enemy presence
34. Establish communication network
35. Identify TRPs
36. Prepare range cards
37. Establish routes to subsequent position
38. Supervise obstacle and camouflage construction
39. Adjust firing as necessary
40. Coordinate squad relocation if necessary
41. Direct relocation fire
42. Make new range cards as needed
43. Direct movement to assembly area
44. Direct cover fire while moving to assembly area
45. Assign exposed fire team as needed when mounted
46. Coordinate fire needs per PL instructions while mounted
47. Direct squad movement during disengagement
48. Communicate with PL during disengagement
49. Direct proper movement to regrouping

Platoon Leader

50. Conduct reconnaissance
51. Check accuracy of terrain maps
52. Check on support fire availability
53. Decide to engage unexpected fire or not
54. Direct mounted defense
55. Communicate with OPs
56. Request possible support fire requirements
57. Select positions for cover, concealment, observation
58. Establish inter-squad communication network
59. Assign locations to SLs
60. Establish TRPs
61. Assign fire zones and targets
62. Communicate with company and/or artillery
63. Direct vehicle firing locations
64. Direct vehicle movement patterns
65. Communicate with OPs and company as necessary
66. Decide when (or if) to relocate
67. Order relocation
68. Direct relocation cover
69. Coordinate changes in TRPs, etc., after relocation
70. Order move to assembly area
71. Direct protective fire for move to assembly
72. Direct squad fire zones while mounted
73. Direct squad fire requirements while mounted
74. Direct disengagement
75. Call indirect fire required for disengagement
76. Coordinate regrouping

2. Armor

Tank Platoon Leader

1. Coordinate with 81mm FO (Fire Planning)
2. Coordinate with ARTY FO (Fire Planning)
3. Select firing positions for tanks
4. Select observation posts
5. Select routes
6. Select alternate positions
7. Select supplementary positions
8. Communicate positioning of tanks to the tank CDRS
9. Operate intercom/radio
10. Supervise defensive preparations
11. Inspect for readiness
12. Approve tank commanders' firing data
13. Approve FOs fire plan
14. Prepare PLT fire plan
15. Acquire targets
16. Determine when to commence engagement
17. Order FOs to adjust fires
18. Control employment of coordinated PLT tank fires
19. Operate laser range finder
20. Override gunner's traverse
21. Fire 50 CAL MG
22. Decide when to (if) relocate
23. Control formations on the move
24. Adjust indirect fires
25. Issue fragmentary orders
26. Issue spot reports

Tank Commander

27. Coordinate with gunner
28. Coordinate with driver
29. Occupy firing position
30. Plan fire control measures
31. Escort PL or TM CDR during inspection
32. Report enemy sightings
33. Acquire targets
34. Engage targets on order
35. Adjust indirect fires
36. Operate laser range finder
37. Issue crew fire commands
38. Fire 50 CAL MG
39. Decide when to (or if) relocate
40. Control driver actions when moving
41. Transmit spot reports to tank PL LDR

Tank Gunner

42. Acquire targets
43. Track targets
44. Receive fire commands from TK CDR
45. Fire main gun
46. Fire COAX MG

Tank Loader

47. Load COAX MG
48. Load 50 CAL MG
49. Handle main gun rounds
50. Load selected rounds
51. Conduct WPN safety checks
52. Conduct commo operation checks
53. Set head space and timing on 50
54. Operate breech mechanism
55. Operate fire/safety switch
56. Advise gunner when COAX and main gun can fire
57. Conduct immediate action to correct COAX malfunction
58. Unload unoperational main gun rounds

3. FIST

FIST Chief

1. Receive orders and plans from TM CDR
2. Coordinate with TM CDR
3. Coordinate with PLs
4. Coordinate with FSO
5. Select observation posts
6. Plan WPN SYS, round, FUZE, MOE, & MOC for each target
7. Operate laser locator-designator
8. Orient for direction
9. Determine exact position on the ground
10. Adjust corrective fires
11. Engage targets of opportunity
12. Adjust CLGP (laser)
13. Determine when to request end of mission
14. Adjust ICM mission
15. Adjust counterfire mission
16. Adjust immediate suppression
17. Approve FO calls for fire
18. Redirect FO calls for fire

19. Request FSO provide GS artillery support
20. Adjust TACAIR
21. Adjust high burst
22. Adjust attack helicopters
23. Adjust mortars
24. Adjust illumination
25. Adjust danger close
26. Adjust multiple missions
27. Report target engagement results
28. Order relocation of FIST
29. Relay calls for fire

Forward Observer

30. Receive plans and orders from FIST Chief
31. Receive plans and orders from PL
32. Coordinate with FIST Chief
33. Coordinate with PL
34. Coordinate with FDC
35. Select observation posts
36. Operate laser locator-designator
37. Orient for direction
38. Determine exact location on the ground
39. Acquire targets
40. Determine range of target
41. Determine direction of target
42. Engage targets of opportunity
43. Adjust CLGP
44. Determine when to request end of mission
45. Adjust ICM missions
46. Adjust counterfire missions
47. Adjust immediate suppressive fires
48. Adjust TACAIR
49. Adjust high burst missions
50. Adjust attack helicopters
51. Adjust mortars
52. Adjust illumination
53. Adjust danger close
54. Adjust multiple mission
55. Report target engagement results
56. Relay calls for fire

Fire Support NCO

57. Receive plans and orders from FIST Chief
58. Redirect FO calls for fire

Radio Telephone Operator

59. Operate field telephone

4. Artillery

Battery Executive Officer

1. Supervise battery when it occupies a firing position
2. Lay the battery when it occupies a firing position
3. Measure and report directions
4. Control fires of the battery
5. Insure sections store, segregate and protect ammo
6. Insure ammo is distributed IAW anticipated needs of FDC

Howitzer Section Chief

7. Insure that weapon is properly emplaced
8. Insure weapon is ready for action
9. Lay the weapon
10. Select aiming points for gunner
11. Sight to the crest
12. Order when to boresight
13. Order azimuths marked
14. Order the prefire checks performed
15. Measure and report site to the crest
16. Determine piece to crest range
17. Supervise section during firing

155mm Gunner

18. Lay cannon on initial direction of fire with aiming circle
19. Lay cannon on initial direction of fire with compass
20. Lay cannon on initial direction of fire with distant aiming point
21. Lay cannon on initial direction of fire by reciprocal lay of another cannon
22. Verify direction of fire with reciprocal check as control piece
23. Verify direction of fire with reciprocal check as adjacent piece
24. Verify direction of fire with reciprocal check using lighting device
25. Boresight the panoramic telescope with the MAO alignment device
26. Boresight the panoramic telescope with a distant aiming point
27. Boresight the panoramic telescope with the collimator
28. Boresight the panoramic telescope using the testing target
29. Set/lay cannon for deflection
30. Refer the piece
31. Orient a map with a compass
32. Orient a map by terrain association
33. Determine present location by terrain association
34. Locate a point on a map using the military grid-ref system

155mm Crew Member

35. Lay commo wire to FDC
36. Connect wire to telepost terminal on vehicle
37. Emplace/recover collimator
38. Emplace/recover aiming posts
39. Store ammo at a cannon position
40. Monitor and relay fire commands
41. Prepare ammo for firing
42. Recognize ammo types by color coding
43. Identify fuzes and fuze wrenches by type
44. Fuze the projectile
45. Set the fuze using the proper fuze setter
46. Prepare propellant charge
47. Set/lay cannon for quadrant with the range quadrant
48. Operate M109A1 Howitzer under unusual conditions

Unit II

Rules For Sleep Management

- Begin the work phase immediately after eastbound flights to assure that the soldier will be sufficiently tired to sleep during off-duty phase.
- Before starting continuous operations, allow 12 hours for rest and sleep.
- Provide 12 hours of sleep after 36 to 48 hours of continuous operations, if a normal or light work load of eight or less hours per day preceded the period of continuous operations.
- Allow soldiers at least 15 minutes after being awakened before involving them in assignments.
- When extended sleep is not possible, "cat naps" will be beneficial.

Advisable Work-Rest Schedule Under Stressful Battlefield Conditions

Hours On	Hours Off	
8	8	Up to 5 days continuous operation
8	4	
6	6	
4	4	
16	8	Up to 30 days continuous operation
4	4	

Effects of Prolonged Continuous Operations on Soldiers' Performance [1]

Decreased Vigilance. The soldier is less and less alert. For example, he fails to detect the appearance of targets.

Reduced Attention. The soldier is slow to notice changes of conditions or in the overall environment. For example, he is slow to notice hand signals or moving "bushes."

Slowed Perception. The soldier is slow in making sense out of things seen or heard, and especially of patterns. For example, he is slow to interpret the significance of changes in enemy fire patterns.

Inability to Concentrate. The soldier cannot keep his mond on momentary activity. For example, he cannot follow complex directions or perform numerical calculations. He is confused.

Faulty Memory. The soldier's shortterm memory (for recent events) is faulty. For example, recent target data elements cannot be recalled or are recalled incorrectly.

Slowed Comprehension. The soldier takes longer and longer to understand oral, written, or coded information. For example, he may take a long time to find a location on a map.

Slowed Responding. The soldier is slow to respond to events. For example, there is a delay in translating a simple order into action.

Increasing Omissions. The soldier begins to skip tasks. For example, he fails to perform weapons checks.

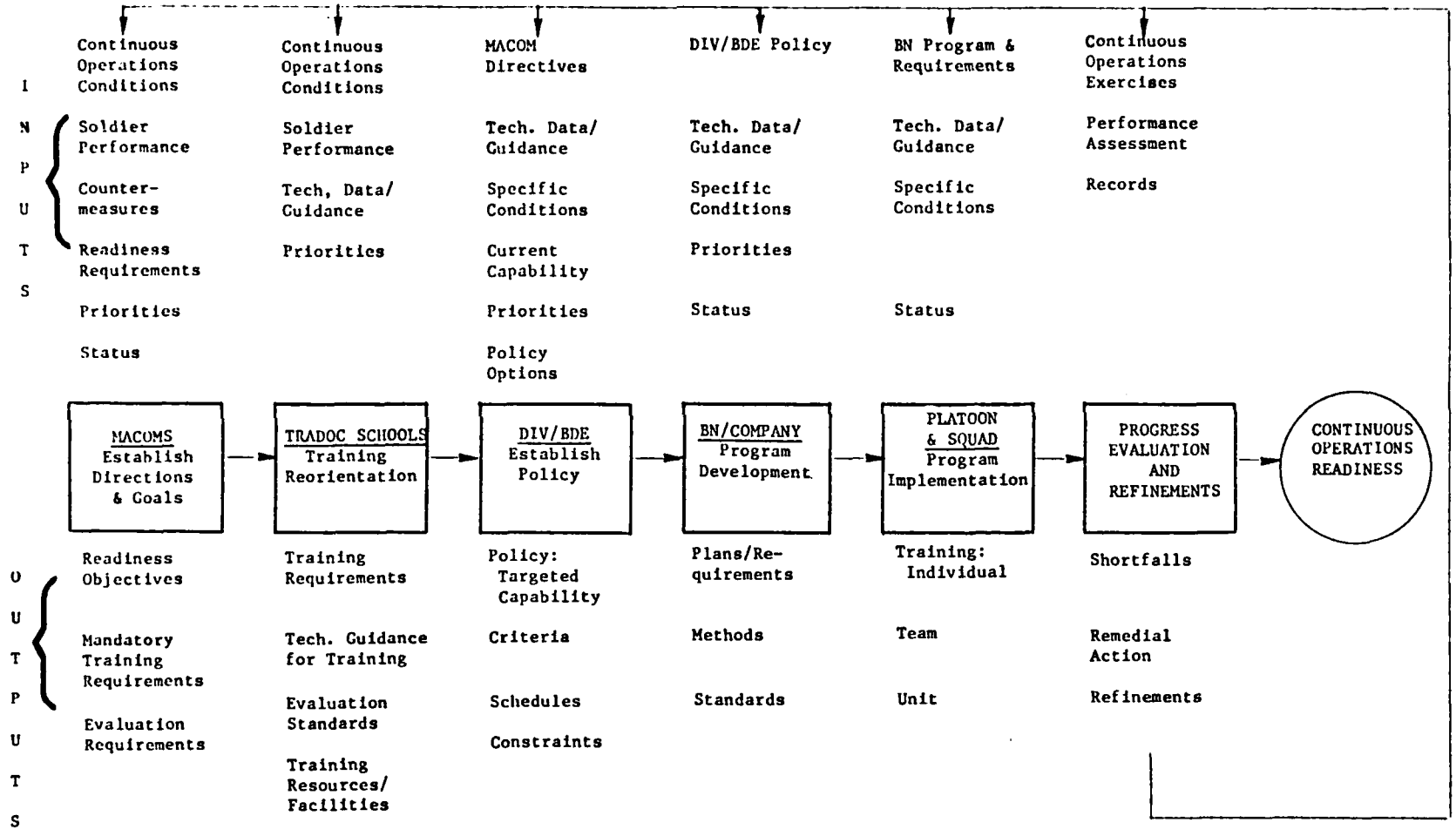
Encoding/Decoding Difficulties. The soldier finds it difficult to transform data or to process information. For example, map/chart coordinates are enclded/decoded slowly, and mistakes are made.

Fuzzy Reasoning. The soldier's thinking or reasoning becomes slow and confused. For example, even simple tactical situations cannot be assessed.

Communication Difficulties. Increasingly, the soldier has difficulty in deciding what needs to be said, how to say it, or what was said by someone else. For example, the soldier cannot formulate a coherent message and omits important information in inssuing spot, status, or damage reports.

Mood Changes. Significant changes in mood normally accompany performance degradation. These may include increased irritability, but will be mainly in the direction of depression and apathy.

[1] Any or all of these symptoms might be produced, also, by exposure to radiation, chemical and biological agents, or by disease.



Flow of counter degradation measures preparation

THE TIME FRAME

Strategies	Tactics
BUILDING ENDURANCE OF EFFECTIVE PERFORMANCE	*APPLICATION OF COUNTERMEASURES TO SLOW DEGRADATION*
D-MONTHS	D	D+DAYS
LEADERSHIP TRAINING PHYSICAL CONDITIONING COMMITMENT TALENT SELECTION RESOURCES MANAGEMENT	TASK RESTRUCTURING ROTATION WORK/REST CYCLES PERFORMANCE SUPPORTS STRESS MANAGEMENT SLEEP DISCIPLINE

Applicability of Counter Degradation Measures for Conserving Various Abilities

Ability	Sleep Discipline	Work/Rest Cycles	Stress Management	Rotation	Task Reallocation	Task Sharing	Task Replication	Special Talent	Performance Supports	Physical Conditioning	Commitment	Leadership
Vision	H	H	S	M	H	H	H	M	H	-	-	-
Hearing	H	H	S	M	H	H	H	S	M	-	-	-
Strength	H	H	M	M	H	H	M	H	M	H	S	-
Impulsion	H	H	M	M	H	H	M	H	S	H	S	-
Motor Speed	H	H	M	M	H	H	M	M	S	H	S	-
Static Precision	H	H	H	M	H	H	H	H	S	H	S	-
Dynamic Precision	H	H	H	M	H	H	H	H	S	H	S	-
Numerical Facility	H	H	H	M	M	M	H	M	M	-	S	-
Verbal Facility	H	H	M	M	M	H	H	S	S	-	-	-
Memory	H	H	H	M	H	M	H	M	S	-	-	-
Orientation	H	M	M	M	H	M	M	S	S	-	-	-
Reasoning	H	H	H	H	H	M	M	M	S	-	S	-
Perceptual Speed	H	H	H	H	H	H	H	M	S	-	-	-
Social Coordination	H	M	H	M	H	S	S	-	S	-	H	H
Communication	H	M	H	S	H	S	S	S	S	-	M	-

S = Slight
M = Moderate
H = High