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Research Note 85-68

# Soldier Performance in Continuous Operations

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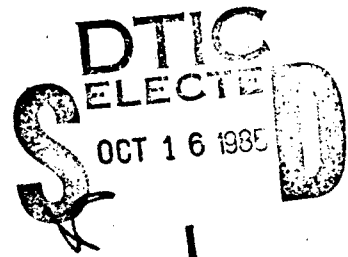
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<p>If any Army unit is to meet the demands of continuous operations, a systematic human resources conservation program must be planned and implemented. The details of such a program are described. Without such a program, intolerable levels of performance degradation during continuous operations can be projected.</p> <p>Strategies for countering the anticipated degradation during continuous operations include: leadership training, confidence building, (Continued)</p>		

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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.

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# CHAPTER I

## CHALLENGES

### Section 1. General

#### General

This Manual deals with methods for sustaining soldiers' performance during continuous operations. Battle in Central Europe against forces of the Warsaw Pact has been called the most demanding mission that the U. S. Army could be assigned, but anywhere in the world a continuous mission may be required. In any such conflict, combat operations are expected to continue around the clock at a constant high pace. Soldiers will be required to fight without let up for extended periods. Given these conditions, the soldiers' performance will suffer. The procedures for ensuring soldier performance capability, and for conserving it in battle, need to be well understood.

#### Purposes

This Manual serves several purposes:

- ▼ Principles for countering and slowing the erosion of soldier resources are presented
- ▼ Methods are given for conditioning units for continuous operations, and for preserving their fighting capabilities during continuous combat
- ▼ Factors governing rates and degrees of progressive performance degradation are detailed
- ▼ Differences in expected effectiveness for various types of combat activity over 120 continuous mission hours are illustrated

The information can be used by leaders who plan and manage soldier performance in extended, continuous combat missions. In missions of this type, soldier resources can dwindle rapidly. This problem must be addressed early during initial planning stages. This manual contains the guidance for reducing the impacts of adverse effects on soldiers' performance and for prolonging soldiers' fighting effectiveness.

## Soldier Resources Concept

Soldier resources mean personnel, and their ability and effectiveness to perform in a unit. All units have certain resources or capabilities for completing their missions and for achieving the mission goals. Some of these capabilities are supported by weapons. Others are derived from logistics. Still others may depend on the way a unit is organized. Each is a factor that partly determines the achievement of mission goals. However, one factor links them all: the human dimension of soldier resources. So long as their integrity is maintained, mission success can be achieved; without soldier resources weapons and tactics become useless.

Military leaders have long been aware that their soldier resources shrink in combat. However, they have tended to view this decline purely in terms of the number of soldiers no longer available for duty:

- ▼ Killed In Action (KIA)
- ▼ Wounded In Action (WIA)
- ▼ Noncombat Losses
- ▼ Illness

Soldier resources are further reduced when a unit's personnel are not capable of performing their tasks adequately:

- ▼ Vigilance deteriorates
- ▼ Determinations become inaccurate
- ▼ Reports become faulty
- ▼ Decisions become slow and inaccurate
- ▼ Orders are misunderstood/forgotten
- ▼ Weapons are misused/underexploited

Degradation of soldiers' performance means that they retain only a proportion (percentage) of their initial effectiveness. Continuous unrelieved combat will degrade performance and erode soldier resources. Combat capability will be cut whether the unit is 50% strength, or full strength with soldiers who are only 50% effective.

## Section 2. Future Warfare and the Combat Environment

### Continuous Operations

Continuous land combat is an advanced warfare concept that is made possible by the almost complete mechanization of land combat forces and by the technology that enables effective movement at night, in poor weather, and in other low visibility conditions. Combat can and will continue around the clock at the same level of high intensity for extended periods. Armies now have the potential to fight without let up. The reasons that have traditionally forced a pause--darkness, fatigue, resupply, regrouping--have been largely overcome by technological advances.

### Threat Forces' Intentions

The Soviet view about future warfare is:

The offensive... will be conducted night and day... without let up until the enemy is defeated.

In the case of an initial attack, US/NATO forces will be opposed by the Warsaw Pact. Their approach is likely to determine the character of the initial battles.

Soviet doctrine is characterized by:

- ▼ Conducting warfare day and night, along a broad front, in any weather, until the enemy is defeated
- ▼ Massing forces and solving attack problems in new ways; including chemical and nuclear weapons in their scheme of attack
- ▼ Echeloning of forces to relieve own troops and to maintain unremitting pressure on the enemy
- ▼ Maintaining a highly maneuverable, dynamic offensive
- ▼ Waging the offensive on broad axes; troops cannot mass on a narrow, solid front
- ▼ Expecting uneven offensives; even the term "front line" will not be used

- ▼ Using nuclear weapons and high troop mobility; saturating the battlefield with tanks; expecting wide contaminated zones, fires, and floods; great losses of material, troops, and equipment.

#### The U.S. Army View

The U. S. Army's view has been expressed as follows in FM 100-5:

The United States could find itself in a short intense war--the outcome dictated by results of initial combat.

The confusion, extreme stress, and lethality of the modern battlefield place a heavy burden on human endurance, courage, perseverance and ability or desire to perform combat duties and skills.

Commanders on the modern battlefield can ill afford to relinquish the initiative and not follow up successes because troops are fatigued and environmental conditions have changed.

#### A Problem: Logistics

Because the line of communications may be long and vulnerable, each unit of our fighting forces must be prepared to accomplish its mission(s) with the resources on hand. Combat will be harsh and savage. Opposing forces will be greater in number and have their supply sources nearby. The U. S. Army must prepare its units--down to platoons and squads--to fight outnumbered, and to win. Winning will require the best possible use of material resources and sustaining a high level of soldier performance in the face of adversity. Therefore, maximum effectiveness and efficiency must be gained from the available personnel.

#### Current U.S. Doctrine

The basics of U. S. doctrine are the same at night as during the day; some key features are:

- ▼ slow the enemy rate of movement
- ▼ begin attrition of the enemy well forward
- ▼ engage the enemy at the most effective range of direct fire weapons

- ▼ keep the defense flexible and elastic
- ▼ destroy enemy forces

These activities must be maintained at a high level to assure an effective defense.

### Section 3. Combat Conditions and Soldier Performance

#### Some Close-Ups of How Soldiers are Affected

Section 3 of this Chapter presents descriptions of the performance degradation that you can expect during continuous operations. The conditions to be expected on the future battlefield have never before been encountered by any army. Perhaps one parallel is the World War II experience of the airborne division whose night drop into Normandy preceded the Allied assault on the beaches. They were elite troops, all volunteers, and were exceedingly well trained. Nonetheless, their ability to cope was strained since they had not been prepared for the conditions they encountered. The accounts below are based on notes taken by a contemporary observer.

Initially, the parachute drops were made during the night, zones were missed and many men landed in a marsh.

Only the soldiers who had landed in the marsh seemed relatively alert; soaked and shivering, they had to keep moving for warmth. It was different with the men who had landed dry; some of them fell asleep standing, while Ballard talked to them, then fell headlong. When the formation pulled away from the assembly area, then paused briefly, Ballard saw men fall in their tracks and hit the ground with their eyes closed.

Later "Item Company" was caught unawares by a German divebombing and strafing attack. Overpressure from exploding bombs affected virtually all personnel.

Lieutenant Robert G. Burns found he could not keep his men awake no matter how he tried. Some were in heavy sleep within two minutes of the bombing. It confused Burns; he could not

tell which were the sleepers and which were the wounded and dying. He saw men who, having tumbled down the bank, lay still with their bodies half in water. He went to them, thinking they had been hit, then discovered they were sleepers who had rolled down the bank and had not awakened when they slipped into the frigid marsh. Others lay there in their jump suits, wet through and through, yet sleeping the torpid sleep of utter exhaustion. Officers gave over any attempt to rouse these men. Item Company had become a cipher in the column.

After several days of continuous operations, without sleep, and under exceedingly adverse conditions:

They were dull-eyed, bodily worn and too tired to think connectedly. Even a 30-minute flop on the turf with the stars for a blanket would have doubled the power of this body and quickened the minds of its leaders to ideas on which they had blanked out. But no one thought to take that precaution. The United States Army is indifferent toward common-sense rules by which the energy of men may be conserved in combat. These men had too little time to find their positions and check their weapons. Said Captain Patch of his people on the far right, "They were so beat that they could not understand words even if an order was clearly expressed. I was too tired to talk straight. Nothing I heard made a firm impression on me. I spoke jerkily in phrases, because I could not remember the thoughts which had preceded what I said."

The U. S. Army and its leadership at all levels cannot allow this situation to be repeated in the future.

#### Why Performance Degrades

Continuous combat depresses certain critical human abilities. When these abilities are reduced, performance of combat tasks is degraded. These tasks are no longer performed as quickly or as well as required. After 48 hours, a total loss of sleep becomes very damaging. Even during the first night of combat, visibility is reduced and the normal wake/sleep cycles are upset. Combat is also accompanied by stress, threat to life, noise, and time pressure.

Though essential for endurance, sheer determination alone cannot offset the combined, mounting effects of these adverse factors. For example, as well as perfecting their technique, boxers prepare to cope with exhaustion and the effects of punishment from their opponents to become champions in the ring. Soldiers face far tougher challenges in a far larger ring.

#### What Degrades Performance

This Manual considers those adverse conditions that are most operant in continuous combat. Continuous combat forces the soldier to perform in the face of these adverse conditions:

- ▼ Low Light Level. The amount of light available for seeing landmarks, targets and maps is greatly reduced at night. Twilight, too, presents difficulties.
- ▼ Factors Limiting Visibility. Smoke, fog, rain, snow, ice, and glare make seeing difficult.
- ▼ Wake/Sleep Cycles. Every person is used to being awake or asleep during certain hours of the day. Performance during normal sleeping hours suffers from the disruption of the normal schedule.
- ▼ Stress. Mental stress that results from having to make decisions of serious consequence in too little time, with too little information, in great confusion, and exposed to danger.
- ▼ Fatigue. Fighting without rest and sleep produces fatigue. Tired muscles can be made to go on working. The brain, however, cannot function adequately with too little sleep.

#### How Degradation Shows Itself

As operations continue, every soldier will begin to exhibit signs of decreasing effectiveness. Table 1.1 summarizes the effects of the adverse conditions on significant aspects of soldiers' fighting performance. Because of such deficiencies, performance of combat tasks degrades progressively. Determination to endure must be supplemented by countering the adverse effects so as to slow the rate of performance decline. Most likely,



Table 1.1

Effects of Prolonged Continuous Operations on Soldiers' Performance

**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 mind on momentary activity. For example, he cannot follow complex directions or perform numerical calculations. He is confused.

**Faulty Memory.** The soldier's short-term 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 encoded/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 issuing 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.

degradation will show itself in highly erratic or unreliable task performance. Progressively, for any given individual, team, or unit, it becomes uncertain whether or not an assigned task will be accomplished.

Leaders need to recognize the appearance of these signs in the behavior of their subordinates and in themselves.

#### Degradation: How Far and How Fast

Projections have been made on the basis of computer simulation of the rate at which various kinds of combat performance will degrade. These projections are supported by military research studies of the problem. The projections assume:

- ▼ All adverse conditions present at all times
- ▼ No preparation of troops in countering the adverse effects
- ▼ No appreciable sleep

The projections shown in Figures 1.1 and 1.2 are based on selected, important tasks normally performed by persons in the duty positions shown. Some duty positions are omitted, because their tasks are not judged as vital to mission success and/or performance of these tasks is not projected to degrade very much.

#### What the Projections Show

The first lesson that can be learned from Figure 1.1 is that the performance in all duty positions does not degrade in the same way. Performance on a duty position, where there is a heavier load of "mental" tasks (determining, calculating, thinking, decision making) degrades more rapidly than the duty performance in positions whose tasks are mainly physical (firing, running, lifting, digging). Infantry Squad Leaders, for example, who must request fire, integrate range cards, establish positions, and coordinate squad tactics will show the effects of degradation more severely than their squads (various "Maneuver Team Members"). On the other hand, Tank Loaders, so long as they are mainly occupied with physical loading/unloading main gun rounds, and operating the breech mechanism, will continue to function better than the rest of the tank crew.

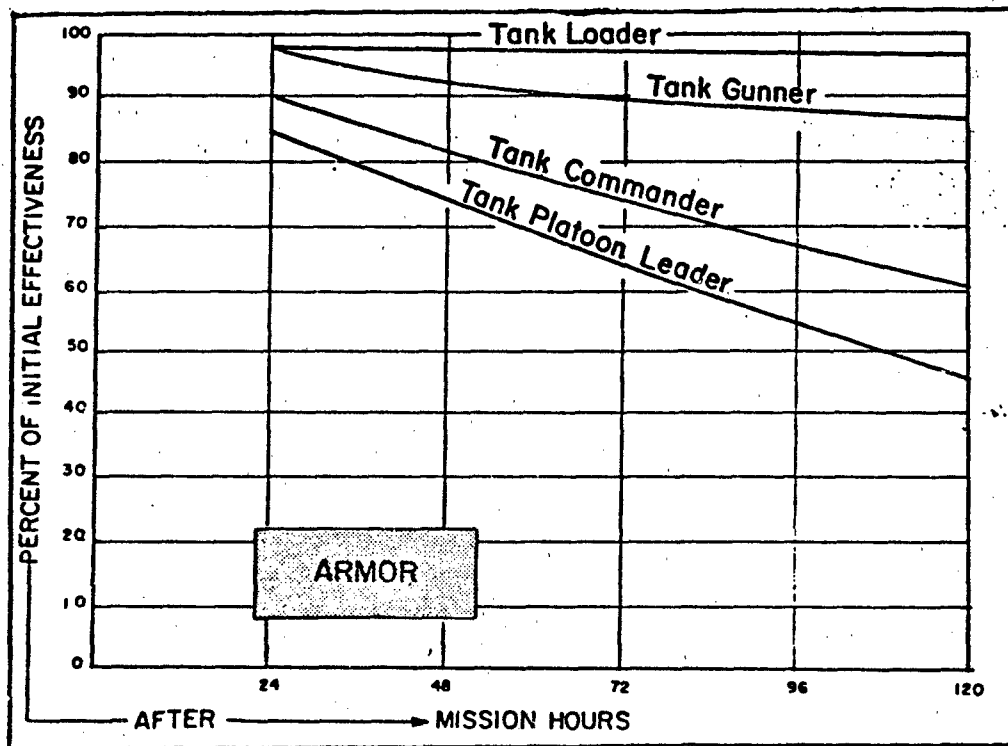
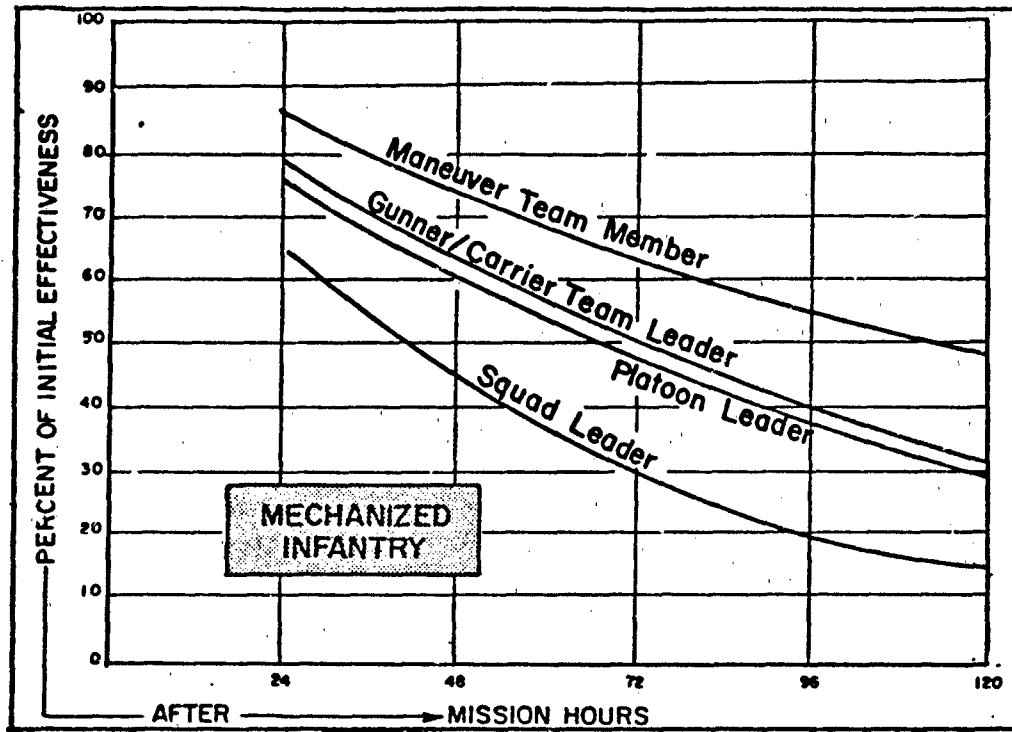


Figure 1.1. Projected performance degradation in continuous operations: Mechanized Infantry and Armor\*.

\*Projections based on computer simulation, and found to agree with studies of continuous military performance.

Differences in the rates and degrees of degradation for different FIST and artillery duty positions can be seen in Figure 1.2. Again, the FIST Chief and Forward Observers perform mentally demanding tasks. Their ability to continue performing these tasks will degrade severely over time. For example, adjusting multiple missions will become exceedingly difficult, and firing calculations are likely to be faulty as well as slow. By contrast, the 155 mm Gun Crew Member, though very tired, will manage to continue fuzing projectiles, preparing propellant charges, and preparing ammunition for firing with some effectiveness.

#### Section 4. The Challenge to Leaders

##### Degradation of Combat Capability

There can be no doubt that the adverse conditions associated with a continuous mode of ground combat operations, or generated by it, will degrade the fighting performance of individual soldiers, teams, and units. The adverse factors are not respecters of military rank and role. If commanders and staffs at all levels perform continuously and without rest, they are likely to become more degraded than their troops.

There is still another way of looking at degradation, i. e., from a command/control point of view. This point of view is shown in Figure 1.3. The projected progressive decline in performance of Mechanized Infantry squads and platoons is shown. The types of combat activity shown in this graph were established through a mathematical technique for examining the critical abilities required for combat tasks. Of course, types of combat activity differ slightly for different types of units. Parallel graphs for other types of units can be found in Appendix A.

As indicated in Figure 1.3, the types of activity most dependent on reasoning, i. e., thinking, problem solving, or decision making suffer most. Some examples of combat tasks representative of each category are:

- ▼ Orientation to Friendly and Enemy Forces-- maintain knowledge of squad's location, maintain concealed disengagement, fire at areas.

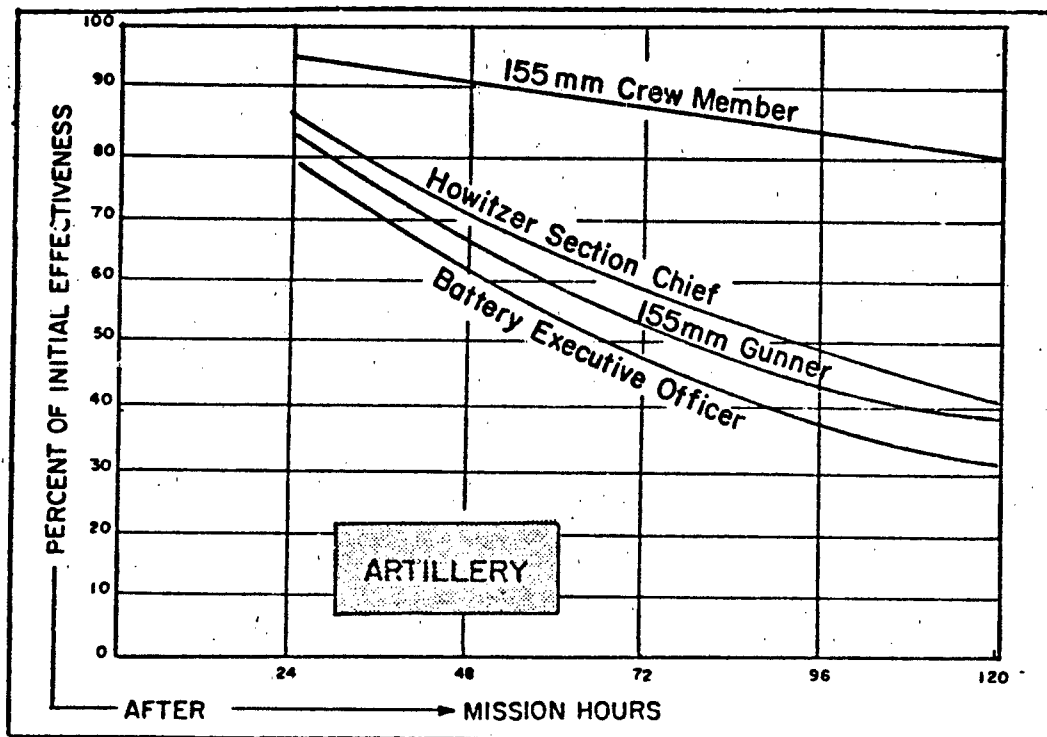
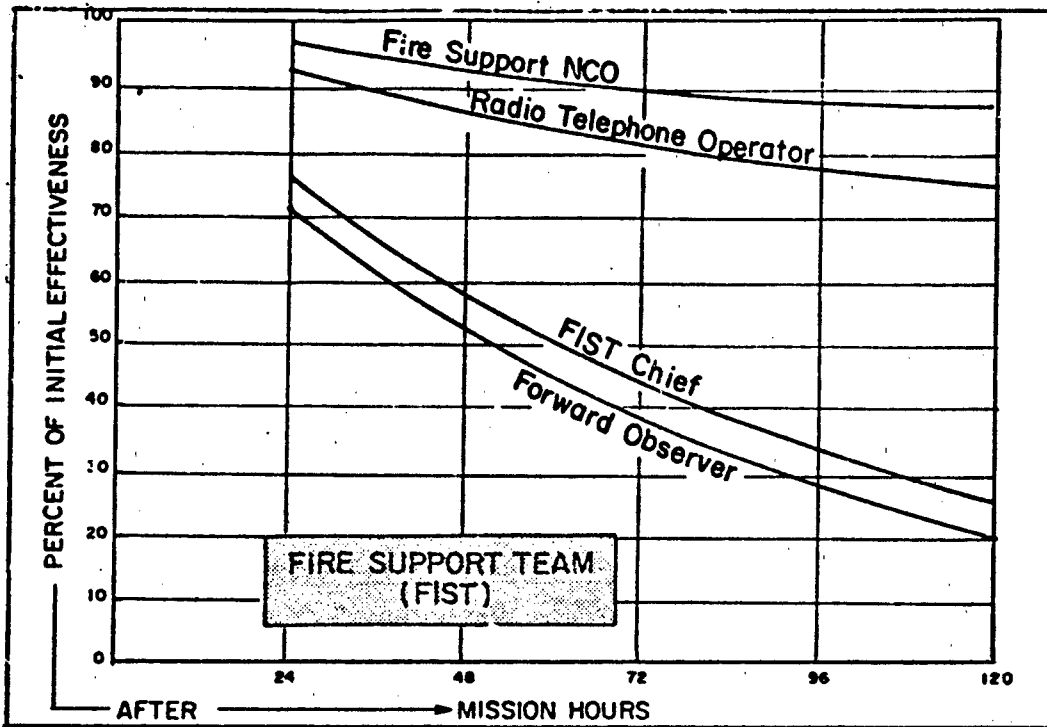


Figure 1.2. Projected performance degradation in continuous operations: Fire Support Teams (FIST) and Artillery\*.

\*Projections based on computer simulation, and found to agree with studies of continuous military performance.

- ▼ Coordination and Information Processing--coordinate firing with other vehicles and dismounted elements, report vehicle readiness, communicate with company, etc.
- ▼ Combat Activity--fire from bounding vehicle, check condition of weapons, observe terrain for enemy pressure.
- ▼ Force Preservation and Regrouping--cover disengaging squads, mark routes between locations, conduct reconnaissance.
- ▼ Command and Control Activity--direct relocation or repositioning, direct mounted defense, assign fire zones and targets.

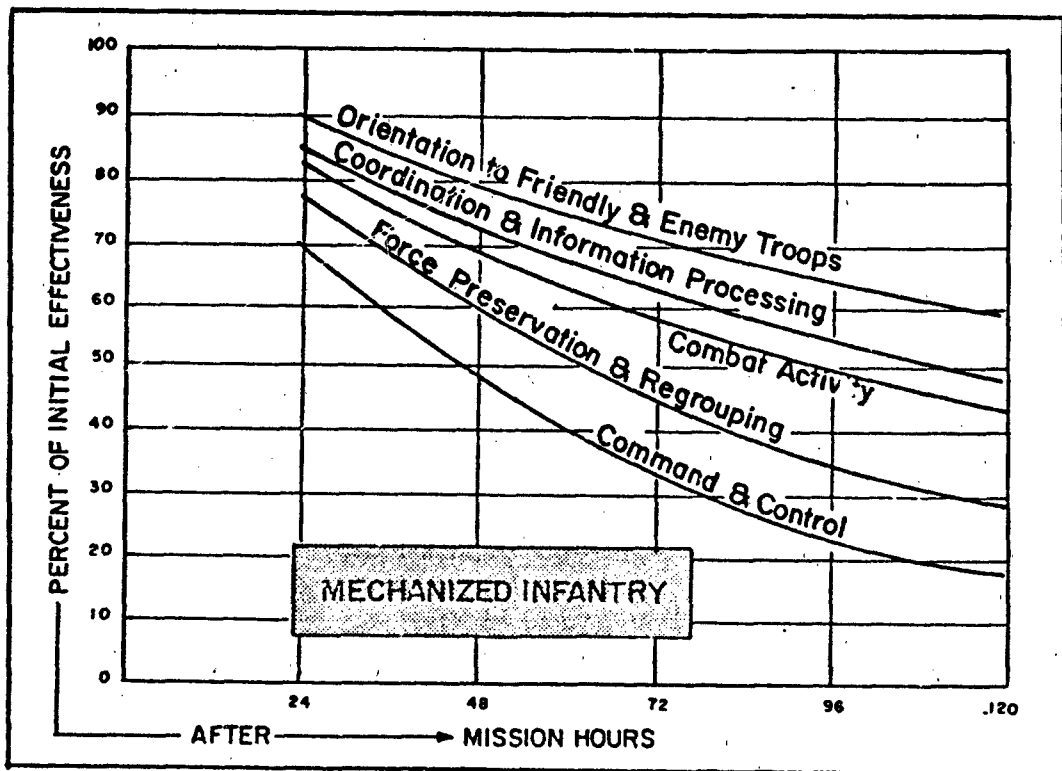


Figure 1.3. Performance decrement by combat activity category for Mechanized Infantry\*.

\*Projections based on computer simulations, and found to agree with studies of continuous military performance.

## Maintaining Command Resources

The effectiveness of an army in combat depends ultimately on the performance of every one of its members. An army consists of soldiers and of leaders of these soldiers. When leaders begin to fail, the organization disintegrates because effective control and direction are disappearing. No fighting organization can endure when its primary objectives are no longer being coordinated. Therefore, it stands to reason that a priority for fighting units is to protect most what they can least afford to lose: their leadership.

When some leader is lost in combat, others will take over the leadership functions and attempt to carry them out effectively. Combat activities degrade roughly in proportion to their dependence on leadership guidance. Certainly "Command & Control" constitutes the essence of leadership, yet this is the type of activity projected to degrade most rapidly. When all soldiers in a unit have been in continuous operations for the same length of time, they are likely to be degraded roughly to the same degree. Relieving one leader, and replacing him with another does not provide a solution to the problem. The true problem is how to maintain leaders in a good enough condition so that they can exercise their leadership functions effectively. While leadership must be protected most, the effectiveness of others must also be protected. Just as a body is useless without a brain, the brain cannot execute its intentions without a body.

## Developing a Continuous Operations Capability

Leaders especially, but also every soldier, team, or unit must develop a capability for effective sustained performance in continuous operations. As pointed out before, while it is an important ingredient, a determination to endure does not assure effectiveness. Acquiring the required capability goes beyond a high level of proficiency in technical specialties and combat skills. It means learning to identify and to cope with the adverse conditions of continuous operations, and overcoming their effects. It means learning how to slow down the rate of performance degradation so as to maintain performance effectiveness.

Strategies and tactics exist for countering degradation, for developing the requisite capabilities in soldiers, and for preparing units to fight continuously. Succeeding parts of this Manual describe these strategies and tactics.

## CHAPTER II

### STRATEGIES FOR SOLDIER RESOURCES CONSERVATION

#### Section 1. General

##### Remedies

All expectations about future warfare point to a challenge during the initial period. Continuous ground combat operations will have to be sustained for an extended period. The conditions inherent in such combat progressively degrade soldier performance. Adverse conditions depress soldier abilities that are critical to effective performance. Accordingly, performance effectiveness declines. This decline adds to the erosion of soldier resources from casualties and illness. Accordingly, the soldier resources available for attaining each mission that might be assigned to any unit are reduced. Remedies exist for countering the effects of adverse conditions on performance, and for slowing the rate of performance decline. These remedies cannot be used haphazardly or selectively; their effectiveness depends on a sound strategy for their application. The strategies are long term remedies which must be introduced and developed in advance of the combat situation. When coupled with tactics (Chapter III) they will minimize performance degradation during sustained operations.

##### Anticipating Demand

The basic principle of creating a maximum of reserves against extreme demands is common to all combat resource management strategy. Soldier resources are analogous to other important combat resources such as weapons, ammunition, fuel, and food supplies. Along with all resources, soldier resource demands must be anticipated. In continuous operations, demands will increase.

##### Creating Reserves

In the case of material resources, for example, ammunition, the stockpiling of types and quantities that match the anticipated target types is a recognized strategy for meeting anticipated demands. Within this strategy, there are considerations such as the type(s) of ammunition that will be required, ease of resupplying the fighting/using units, and security from enemy detection. Soldier resources, however, are not material resources and the means for "stockpiling" them are very different. The considerations appropriate to their creation and "storage" are also entirely different.



Remedies for illness are not confined solely to specific prescriptions against specific symptoms. Preventive strategies are often more effective for keeping groups healthy and active. They include considerations such as improvement or, at least, maintenance of good physical condition, balanced nutrition, and building up bodily resistance to disease through inoculations. Meet the challenge of continuous operations, too, through anticipatory strategic measures. Embed these measures within a carefully designed program to manage a unit's soldier resources so as to achieve a maximum of reserves. Indeed, many specific tactics for countering performance degradation presuppose a prior program of preparation. Without preparation, tactics are not available as options to be exercised in actual combat.

## Section 2. Leadership

*Leadership is the keystone  
for sustained unit performance*

### Leadership

Preparing for continuous operations offers special opportunities for exercising leadership skills. Successful preparation for sustained operations will be highly dependent on this intangible. The leader must plan for the well-being of the system, of the units within the system, and of the individuals within the units. The Army, in continuous operations, will be like a perpetual motion machine. To keep the machine in motion, the leader has the responsibility for eliciting the willing and best efforts of his subordinates. The willing efforts are ensured by early planning, effective two way communication about planning, establishment of mutual confidence, and full professionalism within and across levels. The result will be conditions in which each is willing to give his best when called on.

Plan the objectives to be achieved in operations and how to achieve them; communicate the objectives; keep the objectives reasonable; assign roles and responsibilities; and, assure that the resources are available to achieve these goals.

*Only top standards will do*

**High Standards**

Achieving mission success, given the exceedingly difficult conditions of continuous operations, demands the highest standards of military professionalism. Such standards must be attained in training and maintained in combat. These standards must apply to leadership, to the personal conduct of every soldier, and to the proficiency of performance in all tasks.

Each soldier must realize that the challenges of continuous ground combat operations will tolerate nothing short of top standards. Their achievement will be of benefit to the soldier himself, the unit, and to the unit's mission in combat.

*Develop confidence at all levels*

**Confidence**

It is easier to withstand the adverse conditions of continuous operations when there is an optimistic, confident feeling. Confidence is the deep seated belief of every soldier that his unit can and will accomplish the combat mission, no matter how unfavorable the odds may be. Military experience indicates that confident, cohesive units are able to withstand adverse conditions far better than units without cohesion. Confidence is the strongest bulwark against stress and performance degradation.

Confidence cannot be ordered. It must be developed through appropriate experience that leads each soldier to become optimistic about himself, his equipment, his unit, and the unit's leaders. These experiences must be perceived as strong expectations which lead to successful achievement. These experiences come to the soldier in the well-led unit in the course of training and combat preparation.

*Build confidence in each soldier*

**How to Build  
Confidence**

While confidence cannot be compelled, its development can be fostered through planning and leadership action:

1. Set realistic goals for progressive development of individual, team, and unit competence
2. Systematically test the achievement of these goals
3. Praise improvement and coach units toward achieving higher competence
4. Single out individuals and teams for recognition of competence
5. Support each soldier's confidence at every opportunity
6. Present realistic and detailed expectations about future combat conditions in continuous operations
7. Point out that the enemy faces the same adverse conditions
8. Develop each soldier's confidence in:
  - ▼ self
  - ▼ equipment
  - ▼ unit
  - ▼ training
  - ▼ leadership

**Communications**

Good communications--full and free flow of information--is one of the most important features of competent leadership.

In preparing for continuous operations, full communication is essential. Everyone must be aware of:

- ▼ why each mission is necessary
- ▼ what objectives are to be attained
- ▼ how they will be attained
- ▼ when they must be reached

The practice of good communications goes beyond the mere setting of goals.

- ▼ Keep everyone informed on how well, or how nearly, the goals are being reached
- ▼ Pass information about what must be done (and how) to improve the unit's efforts

Over time, develop channels so that information flows smoothly and reliably. Provide practice so that these channels will function properly even when all of the unit's personnel are in a seriously degraded condition. (Communication is a two way process).

In combat, knowledge of the situation and the status of, both, enemy and friendly units sustains the fighting soldier. Pass all security-free aspects of information as often and as quickly as possible. This constitutes a vitally important part of building and maintaining confidence. This procedure must be followed throughout the preparation period so that it will carry over into the actual continuous combat situation.

*Be a model on which subordinates  
can pattern their own behavior*

#### Serve as a Model

As noted, leadership consists in large part of the kind of behavior that leaders display to their subordinates. Such a display serves two extremely important purposes. It demonstrates:

- ▼ Genuine principles and standards
- ▼ How to behave

Soldiers in battle, and in preparation for battle, are required to conduct themselves in accordance with certain standards. In continuous operations, adherence to these standards is a must. By your behavior, you set the example for adhering to principles and maintaining standards. Anything less will demonstrate that standards are false, and that they can be met by paying them lip service.

Technical knowledge and proper tactical procedures can be explained in words. The explanation covers the precise "how to" including the "do's" and don'ts." Self-control, coping with stress, overcoming fear, doing what is necessary though unpleasant, cannot be explained adequately through words. Such aspects of behavior require a model from which soldiers can learn how to behave in various situations or in extreme circumstances. Behavior modeled on good leaders will carry over to actual combat in continuous operations.

### Section 3. Training

*Training is the core strategy  
of preparing for continuous combat*

Core of  
Preparation

Effective training expands and fixes performance capability. When such a performance capability has been thoroughly established, it becomes highly resistant to the impacts of adverse conditions in continuous operations. Training also creates or improves derivative capabilities such as the capability for coping with stress, thinking when exhausted, and maintaining self-control. Therefore, carefully designed training plans, repetitive and comprehensive assessment of progress toward established objectives, and adjustments in training exercises to meet measured requirements are the core of preparatory strategy.

As training progresses the gradual achievement by the unit of extraordinary performance capabilities is demonstrated to everyone. The training experience furnishes convincing evidence that the "impossible" can be done. This experience supports each soldier's fighting spirit. It shows him that he can and will win.

*Design practice to simulate,  
as nearly as possible, the  
conditions of actual continuous operations*

## Realism of Practice

For all but the simplest kinds of tasks, after basic mastery has been achieved, simulate conditions which are like those under which soldiers will actually have to perform. Adequate performance under "easy," "convenient" conditions is no guarantee of adequate performance under tough, adverse conditions.

- ▼ Train under all kinds of conditions:
  - easy/favorable
  - intermediate
  - difficult/extremely unfavorable
  
- ▼ Practice important combat tasks under all sorts of circumstances, for example:
  - orienting with map and compass in daylight/darkness
  - orienting in terrain that is familiar/unfamiliar
  - assigning fire zones and targets when rested/tired
  
- ▼ Meet ARTEP standards:
  - in daylight and at night
  - in good and in extremely inclement weather
  - in spring/summer and in fall/winter
  - with well functioning and old, balking equipment

When physically and mentally exhausted, each of the steps and decisions in even simple kinds of mental tasks are no longer "automatic" but will require a difficult, conscious mental effort. Repeated experience with this difficult mental effort makes it easier to carry it out, and it improves objective, decision making performance. One feasible tactic for approximating exhaustion during continuous operations is to begin tactical training exercises only after participants have been deprived of all sleep for some 48 hours.

**Realistic  
Performance Patterns**

Further, practicing a task by itself is no guarantee that it can be performed in context. Provide practice, for example, in transitioning smoothly from one task to the next, or in shifting back and forth between two activities (e. g., firing the CAL 50 MG while simultaneously controlling a tank formation on the move). Also, doing a task alone does not guarantee coordinated performance as part of a team (e. g., individual firing on an individual target versus coordinated team firing on a group of approaching targets). In short, the pattern of practice, too, must match the pattern or setting in which the task will have to be performed.

*Initiate crosstraining once all  
soldiers know their individual missions*

**Crosstraining**

Crosstraining will benefit from being integrated with overtraining (see below). Teaching how to perform a task to another soldier benefits the trainer as much as the trainee. Also, requiring the trainee to "teach back" the task to the trainer is one very effective technique in soldier-to-soldier instruction. Both techniques provide motivational benefits as well.

In the "ideal" unit, every incumbent of every duty position of the unit would be competent to perform each and every task. This would help to assure, no matter what the emergency, that there is someone available to perform some critical task or to help in its performance. Extensive crosstraining in a unit not only provides flexibility, it also enables soldiers to exercise initiative in the best and most constructive way. The ideal is scarcely attainable, but it provides a goal.

How much crosstraining is possible depends on practical considerations such as: available time, competing requirements, and individual learning abilities.

The problem in crosstraining is one of priorities, emphasis, and logistics: who should be crosstrained for which tasks, in what order, and how thoroughly? Tasks'

relative vulnerabilities to degradation constitute one of the principal considerations. Performance of some tasks degrades far more than that of others under the impact of adverse factors. For example, two important combat tasks performed by a Mechanized Infantry Gunner/Carrier Team Leader are:

- ▼ Establish revised target reference points (TRPs) plus range cards
- ▼ Fire CAL 50 MG at areas (Recon by Fire)

The first of these tasks is projected to degrade to a level of 25%-30% of initial effectiveness in continuous operations (or to be 70%-75% vulnerable). The second task will barely degrade at all.

Crosstraining, of course, is routinely practiced in all units. Though vulnerabilities of tasks should be a principal determiner of priority for crosstraining, it should not be the only one. Also consider the importance of each task, or how critical it may be to achieving success for major types of combat missions.

*Overtrain individuals, teams, and units to the maximum extent feasible*

#### Overtraining

Overtraining refers to training over and beyond basic mastery of a task whether under "easy" or under "tough" conditions. Extended training beyond initial task mastery (overtraining) produces task performance that is:

- ▼ reliable
- ▼ automatic
- ▼ rapid

Reliable performance means that task performance will be accomplished effectively and in a timely manner on each occasion that it needs to be performed. Automatic performance means that task performance requires no



conscious effort so that the soldier can do it correctly even when half asleep. Rapid performance means that the reaction to the need for task performance and the performance are swift and without hesitation.

Any task, whether performed by an individual soldier, or by a group (team, unit), may be basically "mastered." This means, for example, that on at least one occasion performance to ARTEP standards has been demonstrated. However, ARTEP standards represent only the minimum acceptable level of combat performance and improvement beyond these standards is desirable. Provide practice after this level of performance has been achieved, so that forgetting (lack of practice) will not cause performance to fall short of the required winning standard.

Without this kind of persistent training, performance in combat is likely to be inadequate. Also, performing to ARTEP standards in routine tactical training is no guarantee that these standards of performance can be maintained under the conditions of continuous operations. Overtraining requires practice over and over again.

#### **Economy and Efficiency in Training Operations**

Training economy or efficient training means that the required ability level is achieved in the least possible time for the least cost.

Training under conditions comparable to those of continuous operations is not possible on a day-by-day basis. When such exercises are conducted, and when participating troops have reached a stage of exhaustion, training must make the most of the available time. Spend the time with economy, and extract the maximum of training benefit from the opportunity. Efficient training requires careful advance planning. Identify critical tasks, and especially vulnerable ones, in advance. Determine likely opportunities for their practice during the course of the exercise. Then design scenarios to permit repetitive practice. For example, make plans for repeating specific maneuvers or operations.

When training matches the expected conditions of continuous operations, soldiers quickly learn to cope with these adverse conditions. Therefore, use these

and similar techniques to simulate continuous operations in FTXs and in other combat exercises:

- ▼ Demanding physical activity before starting FTX
- ▼ No sleep (up to 48 hours) before FTX
- ▼ Around-the-clock FTXs
- ▼ Confusion and communications difficulties
- ▼ Logistics problems
- ▼ Simulated equipment malfunctions

### After Action Critique

Increase the efficiency and effectiveness of training by providing corrective guidance to every exercise participant.

Though highly motivated to perform well, members of baseball or football teams require coaching. They may know that something is wrong but they may not know exactly what to do to improve their performance--individually or as a team. Soldiers, teams, and units, too, need guidance to reach peak performance effectiveness.

Diagnostic findings have no practical value unless they are converted to corrective guidance. Feed corrective guidance back to the deficient soldiers, teams, and units. Monitor their response to this guidance. Make the guidance clear and specific. Tell exactly how to achieve better performance. Guidance of the "try harder" variety is quite useless.

### Some Examples

#### DO

Point out differences in...  
(e. g. , weapon signatures)  
to be observed

Demonstrate to soldier(s)  
the best position for oper-  
ating the weapon

#### DON'T

Tell soldier(s) to look  
harder, or to take a bet-  
ter look

Tell soldier(s) he (they)  
used the wrong position

DO

Explain exact details of a report to be provided

Specify clearly the way(s) in which the team is to act together

DON'T

Ask for a better report, or for more information

Tell the team to "get your act together"

Section 4. Developing Coping Skills

*Learn to cope!*

**Coping Techniques**

All members of any fighting unit, from its lowest ranking soldier through its commander, must learn to cope with the impacts of the adverse factors (especially sleep loss). Coping is a combat skill that may well become even more important than the other combat skills in continuous operations. Coping means the ability to compensate for the increasing effects of adverse factors (sleep loss, wake/sleep cycle change, stress).

Cat napping at every opportunity and even for the briefest periods is the technique of greatest promise for holding down the effects of lost sleep. Effective cat napping requires that the soldier fall asleep as quickly as possible, and that he can become awake and be alert just as quickly when he is again needed. Falling asleep quickly and becoming awake quickly are skills that will improve with practice. Because of their nature, these skills cannot be learned from a manual, nor can a "coach" be of much help. In effect, encourage each soldier to learn to coach himself. The relaxation techniques mentioned below require a great deal of practice before each soldier can use them effectively.

The effects of mental stress, tension, fear, frustration, and anxiety prevent the fatigued, sleepy soldier from falling asleep quickly. Coping with stress means

achieving some self-control over the stress process. One or several techniques that can help the soldier gain some control over stress should be incorporated into the training.

- ▼ Relaxation Techniques. Relaxation techniques are methods for calming the mind and the body. The techniques provide a systematic method for obtaining full relaxation and, as a result, lower stress levels.
- ▼ Self-Suggestion. The self-suggestion technique combines self-suggestion and exercise to reach deep mental and physical relaxation. The technique produces feelings of heaviness and warmth that slow down the heart rate and make the heart-beat regular. There are four aspects to self-suggestion. They deal with the repetition of different kinds of phrases: relaxation, warmth, imagery, and activation.
- ▼ Meditation. Meditation employs aspects of the relaxation and self-suggestion techniques. There are several meditation techniques. In some, meditation is combined with breathing and physical exercises. Meditation turns attention inward so as to calm emotions and relax the body. All forms of meditation require deep concentration and produce relaxation.
- ▼ Inoculation. In stress inoculation, stressful situations are brought into mind and ways of handling them are reviewed. Mental practice in coping with the stressful situation carries over to the time when the stress becomes real. The soldier will know how to tackle his problem. He will be better able to master it.

These techniques are not difficult and can be mastered easily. However, they must be practiced until they become automatic. The techniques must become so automatic that they do not need to be thought about when the user wants to relax. When a soldier has reached that point, he will be able to stop "butterflies" in his stomach, slow down his heart rate, and lower his blood pressure. Such abilities are extremely important in continuous operations.

## Section 5. Physical Fitness

### **Resiliency (Bounce Back)**

Develop physical fitness in all soldiers of the unit so as to strengthen their ability for "bouncing back" from exhaustion.

Develop aerobic fitness through such exercise programs as:

- ▼ walking/jogging/running
- ▼ bicycling
- ▼ swimming
- ▼ skipping rope
- ▼ bench stepping
- ▼ stair running

Develop muscular strength through such exercise programs as:

- ▼ weight lifting
- ▼ calisthenics (pushups, situps, chinups, etc.)
- ▼ isokinetics



Isokinetics is a physical exercise technique in which the movement of muscle groups is resisted over their entire range. For example, another person opposes his muscles to those being exercised, or weights put drag on the movements being attempted.

Physical fitness is the ability of the body to stand up under prolonged extraordinary demands without harm. The fit soldier can call upon his mind and body to perform strenuous activity for extended periods and bounce back to normal effectiveness after a relatively short interval of rest. Whether moving heavy weapons, packing bulky loads on his back, or digging in, the fit soldier can draw on his reserves of strength or wind to bounce back with only the briefest of rest. These reserves are maintained on a daily and weekly basis through physical training and being in shape (jogging, calisthenics, swimming, weight lifting).

**Stamina  
(Endurance)**

Develop aerobic fitness in all soldiers to increase their work capacity and ability to withstand the stresses of continuous operations.

For these purposes, fitness is primarily a well-developed oxygen delivery system--strong heart and lungs that efficiently deliver oxygen to the working muscles. Aerobic fitness refers to the efficient conversion of food to muscle-energy by using this oxygen. The connection between aerobic fitness and fighting ability is a direct one. The soldier requires energy to fight--energy created by burning fats and carbohydrates. This process takes oxygen. The tougher the action, the more energy--and oxygen--are needed.

Muscles burn carbohydrate (sugar) or fat for energy. The brain and the nervous system depend on blood sugar for energy. Unfit individuals tend to use more sugar for a given task than do the fit. As the soldier trains for fitness, he becomes better able to fuel working muscles with fat, thus conserving limited sugar supplies for the brain. With more blood sugar available, the soldier is less likely to tire. There are more and better reserves for the muscles as well as for the brain.

Feelings of depression and moodiness usually accompany extreme tiredness. These will affect the aerobically fit soldier far less than the unfit one. Aerobically fit soldiers stay fit mentally and stay sharp as well.

*Develop strength, especially of the upper body, so as to enable the soldier to perform heavy work.*

### Strength (Muscle)

As combat operations continue and adverse circumstances combine to present unusual situations, there will be some situations which require brute strength. For example, disabled vehicles may have to be off-loaded, or pulled out of mud or water. Efforts of this type require upper body strength in addition to aerobic fitness. While jogging, for instance, develops aerobic fitness, it does not build strong arm muscles. Soldiers must develop upper body strength in addition to aerobic fitness.

*Develop in all soldiers the knack for self-pacing.*

### Pacing Energy Expenditure

Even the fittest soldier may begin to use energy faster than his body can furnish it. Each soldier must be trained to pace himself so that he works at maximum rate, but without inducing degradation.

Proper pacing means learning to respond to signals from the body so that a sustainable rate of energy expenditure is maintained. The signals tell the soldier: "I can/cannot keep going at this rate." Train each soldier to recognize them through actual experience and to use them to pace himself.

*Practice at upper limits and beyond*

Practice Pacing

Continuing to work at one's upper limit over extended periods requires considerable mental determination. In learning to pace himself, the soldier learns the signals that tell him where his upper limit is. He also learns another meaning of these signals: that he can keep on going at this rate for some time. In fact, he learns approximately how long he can keep going at various rates of energy expenditure. Rather than a single limit, there are several closely related limits depending on the length of time for which effort must be sustained.

Push the Limits

To extend these limits (either the rate of energy expenditure, or the duration of this expenditure) the soldier must set higher and higher goals, and he must practice to achieve them. The last limit that was reached must always become an achievement to be exceeded on the next try. Determination can extend one's upper limits very considerably.

Sometimes, a situation requires an effort that goes beyond what is thought to be humanly possible. However, the body often is able to summon the necessary energy by drawing on "emergency reserves." Training soldiers to expand their limits also means that they learn that seemingly impossible efforts can be made successfully with a brief, extra effort.

Section 6. Dedication to Winning

*Effective leaders must understand the difference between skills and attitudes*

Skills and Attitudes

Practice develops skills of all sorts. For example, it develops combat skills. Practice also develops skills of a more subtle kind such as the ability to pace oneself for sustained, top physical performance. Any and all of these skills can be learned through effective training which creates those conditions that are most favorable to learning.



Attitudes are also acquired over time, but they are not learned in quite the same way as skills. Attitudes have nothing to do with "how to." They are ways of looking at events, and predispositions (willingness or unwillingness) to act in certain ways. For example, one important attitude in combat is never to let one's buddies, unit, and country down. Attitudes develop over time in consequence of experiences. Desirable attitudes develop when desirable experiences are encountered by the soldier.

Baseball, basketball, and football teams often perfect all their athletic "game skills," yet lose because they have not developed a winning attitude. Good coaches know that honing skills is not enough to win tough contests. The best coaches also inspire their teams to win. They show in everything they say and do--without a single exception--their own genuine dedication to winning. Like sports, combat is a kind of contest in which winning depends on skill and on dedication. Especially in continuous operations, a genuine and single-minded dedication will give the soldier the extra "push" needed to win.

*Develop a spirit of friendly competition among individuals, teams, and units*

#### Competition

A foundation for a winning attitude in combat can be laid during the initial planning stages. This foundation is based on a spirit of friendly competition. It requires that all performance be assessed (scored) and that records of performance be kept. Show respect, and give praise to the top performers. Pointedly compare the sub-par performance with top performance, but also furnish the necessary coaching and guidance that makes improvement possible. Even more than competition among soldiers, teams, and units, encourage self-competition. Suggest targets for improvement, i. e., "Can you top this?" Also, encourage all subordinates to follow in this same sort of pattern.

Recognize and reward consistent achievers in any way possible. At the same time, by work and example, show that dedication to achievement is considered even more important than achievement itself. For example, consistent progress toward improved performance, even when achieved performance levels are short of minimal standards, is a sign of genuine dedication that deserves recognition and rewards.

*Consistently demonstrate to every soldier that a spirit of fairness prevails and that equity of treatment is not dependent on rank or background*

### Fairness and Equity

Some soldiers may be entitled to a larger share of any scarce resource for reasons directly related to their combat mission. For example, soldiers performing exceptionally heavy physical labor should be entitled to extra rations. By the same token, those who must make decisions of serious consequence need extra rest and sleep so as to be able to make the best possible decisions. Equity means a fair distribution adjusted for real need.

Assure a balanced distribution of task burdens. A balanced allocation of tasks (duties, responsibilities) to positions is an important factor in conservation of unit effectiveness. While the critical time for assuring balanced task burdens is in actual continuous combat, smooth adjustments require practice of this policy during the preparation period.

Tasks differ in many ways. For example, they differ in their relative importance to mission success. Mission success is endangered if all important tasks are concentrated in a single duty position. The soldier filling the duty position might become a casualty and be no longer available. Success is also endangered if that soldier's performance capabilities deteriorate to a low level. A low level of effectiveness equates with low dependability of performance. This means there is only a small likelihood that each important task will be carried out adequately.

## Balance the Burdens

The principle of assigning a balanced load of tasks (duties, responsibilities) to participants in combat missions is an important one. While possibilities for task allocations may be restricted by equipment, special skills, and the like, efforts toward balanced assignments should be made. In effect, the balanced distribution of task loads is a part of mission planning. In principle, it precedes the assignment of specific individuals to sets of tasks (jobs); in practice, these considerations may go on simultaneously.

Balancing the allocation of burdens, whether they are task burdens or other adverse effects of continuous combat operations, serves two important purposes. First, it does not overburden any one soldier so that he cannot sustain adequate performance. Second, it demonstrates--again and again--the spirit of equity and fairness. Therefore, it provides the incentive for every soldier to accomplish his fair share of the common mission requirements.

*Unit cohesion or esprit is a consequence of shared experiences in successfully surmounting difficult challenges.*

## Cohesion, Esprit, and Morale

Especially in the small unit, every soldier comes to know and appreciate his peers and his leaders. He recognizes how he depends on all others in the unit, and how all others depend on him. With this recognition comes a feeling of intimacy and a strong sense of responsibility. Cohesion and esprit will develop as preparation for continuous operations progresses successfully, good leadership is demonstrated, confidence in the unit's competence grows, and morale is developed. Unit cohesion is a key source of strength for enduring the stresses of continuous operations (morale).

*Along with encouraging soldiers to adopt a winning attitude, guide each soldier to a personal sense of commitment*

## Commitment

Commitment means that the soldier believes in the reasons for doing his job and for being on the battlefield. He becomes personally convinced that these reasons are good and valid. A soldier's personal reasons may or may not correspond with reasons or ideals of national policy. Nor, may the soldier be able to state his own and personal reasons clearly. Possibly his strongest commitment is to his own unit and to his fellow soldiers in it. It is the efficient functioning of these small units that usually wins in battle, and thereby insures attainment of the broad national goals.

Commitment cannot be compelled. Like confidence, trust in leadership, and cohesion, commitment grows as a consequence of good soldier resource management. A strong commitment sustains the soldier in combat.

## Section 7. Resource Management

*Manage the development of your soldier resources*

## Effective Use of Resources

No matter what the quantity and quality of available resources, using them to best advantage requires advance planning. For example, each type of weapon and ammunition is most effective against certain types of targets. Soldiers, too, are most effective in some roles, and this effectiveness may further depend on existing conditions. Potential roles within continuous operations conditions need to be foreseen. Special requirements that are apt to arise in continuous operations must be identified, and contingency plans established in advance. Effective exploitation of any resource serves as a force multiplier. Soldier resources are no exception to this rule.

Establish goals for each unit and individual. Task units and individuals in terms of these priorities and goals. Evaluate in terms of these tasks. Check on intermediate achievement and follow General Bruce Clarke's advice that "A unit does well the things the boss checks."

When you establish priorities, insure that they are realistic and attainable. Of course, the resources must be made available for achieving these requirements. Everything cannot be the number 1 priority and after you have established priorities, be prepared to accept the consequences for them. Expect subordinates to solve implementing problems as they arise, but do not expect them to become scapegoats when failures occur.

Evaluation and goal setting depend on the best professional judgment. How well were the goals achieved in view of circumstances within the unit, which reasonably affect the expectation of improved performance and progress over time? Moreover, priorities will change over time. When this occurs, the associated goals will need to be modified.

Management marks off the progression towards goals in terms of meaningful tasks and evaluates progress toward these goals.

*Know the strengths and weaknesses of every soldier under your control--including yourself*

## Know Your Men

To achieve the goals of sustaining performance during continuous operations, it is necessary to know your men.

Just as conditions and the requirements they impose vary, soldiers vary in their talent (qualifications) to satisfy these requirements. For example, the ability to orient--to identify one's location and to find one's way over strange terrain--is known to differ among soldiers. Some have a "good sense of direction," and some have a "poor sense of direction."

Talent also means the soldiers who have the sharpest eyes and ears in the unit (for spotting enemy infiltration), soldiers who have some familiarity with a Slavic language, or those who estimate range best. Good resource management identifies such special talent early and earmarks these special resources against the appropriate contingencies.

Systematically search for and identify special talent. For some types of special abilities, such as knowledge of Russian, Polish, or Ukrainian, the search procedures are simple and self evident. For others, such as the ability to detect infiltration attempts, plan the training and tactical exercises so as to permit the identification. For example, through coordination with OPFOR elements, repeated infiltration attempts can be scheduled. Soldiers who consistently are among the first to spot these attempts are thereby identified as those with the "sharpest eyes and ears."

*Anticipate progressive degradation of performance and preplan the appropriate adjustments in performance demands or compensatory aids*

#### Managing Reduced Performance Capability

Figures 1.1 through 1.3 demonstrate the degrees of progressive performance degradation that must be expected. To some extent, these effects can be offset by two complementary techniques:

- ▼ system modifications
- ▼ performance supports

For both purposes, examine the process in question. Analyze it in detail so as to make every step explicit together with the factors on which success depends. Then, review for possible simplification, streamlining, or even just making one or more steps easier to accomplish.

## System Modification

System redesign or modification possibilities fall into three categories:

- ▼ physical
- ▼ informational
- ▼ procedural

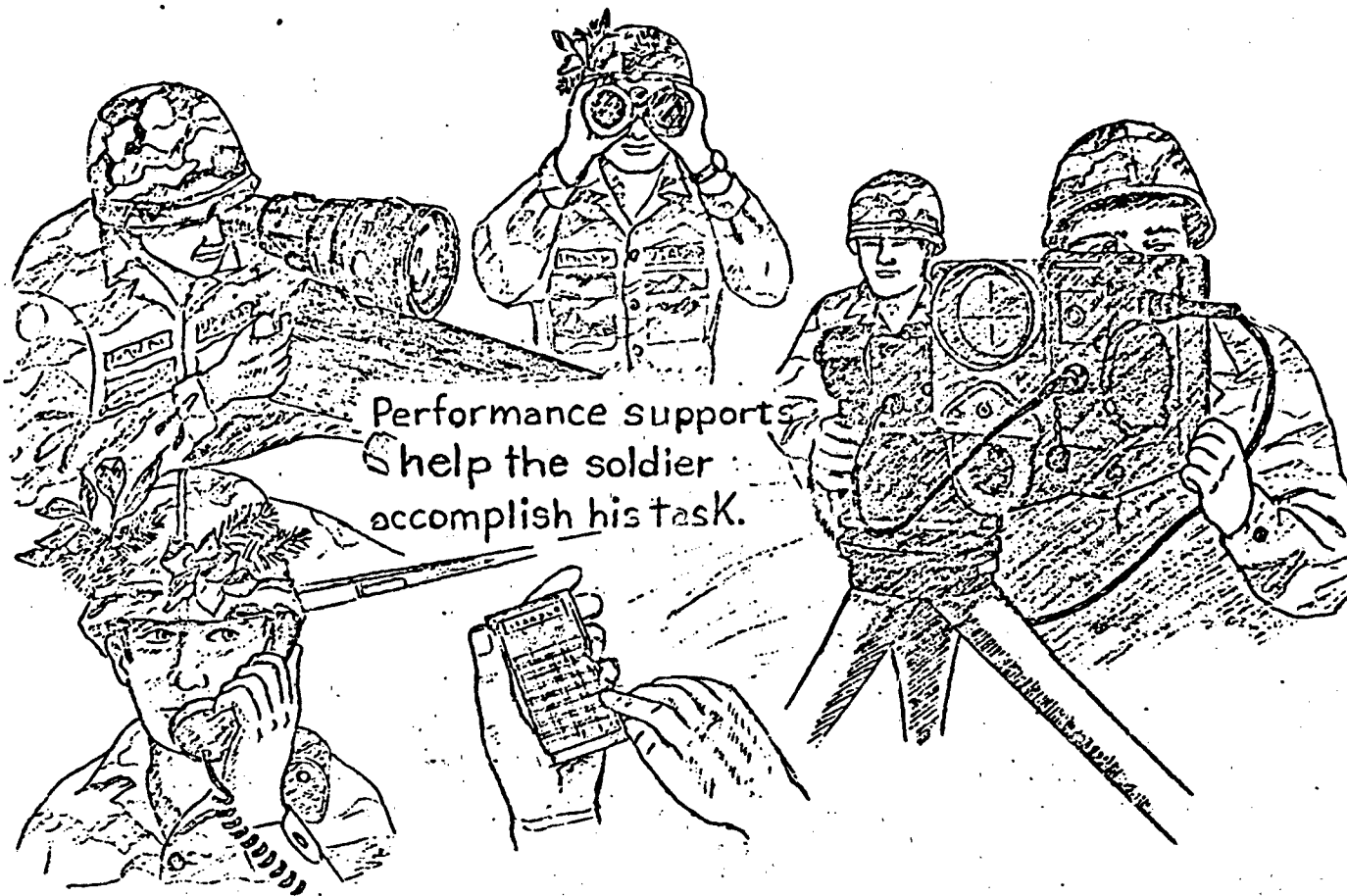
An example of physical system modification is the pattern of storing various types of ammunition at a gun position. Even minor adjustments in location, stacking, type of separation, etc., can decrease the demand on the soldier resources for fuzing and loading designated rounds. An informational modification might be an increase/decrease, or a rearrangement of information arrayed in a single display (chart, CRT, status board). Such changes reduce the mental demands when someone using the display selects and processes relevant information. A procedural modification may involve moving some step (or sequence of steps) upstream or downstream. Select tasks which must be performed when the stress is high and schedule them so that they are carried out when the stress is low.

*Emphasize the use of performance supports*

## Performance Supports

A performance support helps the soldier to accomplish his task. A tired soldier may need a lever to shift heavy equipment. The lever is a performance support.

Many kinds of performance support already exist and are in common use. Binoculars support distance vision. Telephones or radiotelephones support distance communication. Many types of night vision devices (NVDs) and ground surveillance radars (GSRs) aid human vision in the dark. Laser target designators (LTDs) and rangefinders support soldiers' judgments in accurate range estimation. Computers, or merely hand held calculators, support numerical operations and human thinking (most degraded/vulnerable in continuous operations!).



High technology is not necessarily required for performance support. Many types of performance supports are of a rudimentary nature: note pads, charts, plexiglass overlays, and grease pencils. Other types of support require only a moderate level of technology: (micro-) cassette recorders, and optical filters for enhancing contrast or shifting colors.

Emphasize the use and development of such supports for performance so as to enable each soldier to accomplish tasks successfully when his initial performance capability is degraded.



*Find techniques and procedures for supporting the abilities that are critical for successful performance of important tasks*

Support  
Critical Abilities

Long before the acute need arises, prepare to support critical abilities. When the need does arise, the means for supports must be familiar, practiced, and comfortable. Some of these supports are schemes or procedures rather than physical objects. Support of abilities underlying actual performance further helps to sustain that performance.

*Encourage the development of better ways to get the job done*

Stimulate  
Creative Ideas

Better and easier ways to accomplish important tasks in continuous operations are a leadership problem, but it is everyone's job to find them. For instance, numbers and their mental manipulation become more and more difficult with cumulative sleep loss. For many purposes, tables can be precalculated, or curves drawn, or nomographs developed to aid the soldier. Similarly, the ability to differentiate friendly and enemy equipment suffers with loss of sleep and other stress. Comparative drawings (or silhouettes) of friendly/enemy equipment, but with the differences-to-look-for emphasized, can help to make more reliable determinations. Other examples of this type can be imagined.

Enlist the aid of every member of your unit in following up on the hints provided. As pointed out before, those who actively perform various types of activities are in the best position to recognize ways of aiding performance and supporting the abilities involved. Encourage, recognize, reward, and disseminate suggestions on how to facilitate performance and, especially, performance while the soldier is in a degraded condition.

## CHAPTER III

### TACTICS FOR SOLDIER RESOURCES CONSERVATION

#### Section 1. Tactics for Sustaining Performance

##### Conserving Combat Capability

The strategy of conserving the assets a unit brings to active combat and of depleting the assets at the slowest achievable rate is not specific to soldier resources. Combat cannot be conducted without a minimum of assets in certain essential resources. The expendable resources include ammunition, fuel, critical spare parts, and food; they also include the fighting soldiers' capabilities for continued performance of their combat functions. Battles may be won or lost depending on successful budgeting of critical resources. Soldiers' performance capability--its endurance--is one of the critical resources whose expenditure in combat must be carefully managed.

To make conservation work, effective tactics in the application of various countermeasures to degradation must be used. Virtually all of the tactical options depend on advance preparation, planning, and extensive practice. Failure to prepare conscientiously will deprive soldiers and their leaders of the vital remedies that retard exhaustion and sustain effective fighting performance in continuous operations.

#### Section 2. Resource Management Tactics

##### Key Men, Not Man

In combat, requirements for critically important performance occur often; when these requirements occur, assign the best available talent (previously identified).

Whatever the requirements of the combat situation (detection, orientation, muscle), assign a soldier or unit of proven talent to that role. However, remember that such special talents are not confined to single soldiers or units. Do not make the mistake of relying

on a single key man or unit. By being overburdened, he may succumb to exhaustion. Rather, rely on the several soldiers or units who represent the best available talent for the given task.



*Other things equal, in continuous operations assign those soldiers to critical combat roles who least show signs of exhaustion*

#### Assign the Least Degraded

Of course, fresh, or more rested soldiers normally will show the least performance degradation. However, even in a single unit, soldiers who have been in combat for the same length of time and under the same overall conditions will show differences. Even on the same battlefield, conditions for all soldiers are not absolutely identical, and some soldiers are able to bounce back more than others.

*Order frequent task rotation among all soldiers and units competent to perform the given task*

#### Task Rotation

In many tasks, performance declines with prolonged execution of the task. This decline is additional to the degradation from fatigue and other adverse factors. Tracking enemy targets with the MG or in an optical sight are examples of such tasks. Both, time off-target and number of times off-target increase the longer these tasks are performed.

In exhausting combat, the burdens need to be shared equally. Prolonged task performance is a burden. It contributes to the degradation from overall fatigue and other adverse factors. It concentrates the load on a single individual or unit. It may push them "over the line" into total exhaustion. Frequent rotation provides relief and, at the same time, maintains more effective performance.

*As continuous operations are prolonged, direct more and more shared execution of important tasks*

### Task Sharing

Soldiers derive mutual support from each other. An important technique for counteracting the cumulative effects of the degrading factors on military performance during continuous operations is to share responsibilities (tasks). Sharing does not mean reorganizing the lines of responsibility, as specified by the TOE. Rather, sharing means a rearrangement, either partial or full, of certain task responsibilities. For some kinds of task sharing, appreciable improvements in effectiveness have been projected.

When degradation in the unit is substantial, assign two or more soldiers to any important task. If the task is a physical one (e. g., loading/unloading supplies), the task demand on each of two soldiers is less than that on a single soldier. If the task is a tedious, repetitive one, the interaction with another person serves to maintain alertness, interest, and reliability of performance. If the task is of a vigilance type (e. g., sentry duty), the presence of another soldier helps to ward off fatigue. Also, though attention may lapse, it is less likely to lapse at the same time in two or more people.

*"Two heads are better than one"*

### Cross-Checking

Leaders are subject to the same adverse factors that affect all soldiers. Often self-control may overcome hunger, physical fatigue, or even shake off an overpowering desire to sleep, but it can only go so far to slow the degradation of "mental" performance. Leaders must expect to become degraded and recognize the need to compensate for their own progressive inadequacies. After 36 hours in continuous combat operations, cross-check every significant determination, calculation, or decision. While command or leadership responsibilities cannot be delegated, the thinking involved can be checked with others.

preparation period for continuous operations. During that earlier period, the "what if" question should be asked for each critical combat task. The answers to "what if" should be worked out in advance and practiced thoroughly.

*Encourage systematic reliance on performance supports as operations continue*

Increasingly Use  
Performance Supports

The nature of performance supports was described in Chapter II. As degradation progresses, rely more and more on performance supports.

### Section 3. Stress Management Tactics

*Learn to recognize the signs and to judge the degree of degradation*

Recognizing  
Serious Degradation:  
In Others

To select the least degraded soldier for some important combat task, the signs of degradation must be observed. These signs will not be constantly observable. Rather they will show themselves intermittently. The more of these signs a soldier shows, the more frequently, and the more strongly they show themselves, the more degraded the soldier is likely to be.

Look for the signs in Table 1.1 and these outward signs of progressive degradation:

#### Some Physical Signs

- ▼ Vacant stare--eyes seem to be fixed and unfocused
- ▼ Skin pallor--skin is pale
- ▼ Postural instability--sways while standing up

### Some Behavioral Signs

- ▼ Slowness of response--slow to respond to signals, directions, events
- ▼ Lapses in attention--for moments the soldier is "not there," or seems asleep
- ▼ Inability to grasp directions--has difficulty in comprehending orders, may have to repeat them to himself several times
- ▼ Difficulty with numbers--cannot keep numerical groups straight, cannot do simple arithmetic
- ▼ Difficulties in expression--has difficulty formulating verbal statements and messages
- ▼ Unclear speech--speech may be slurred
- ▼ Decision problems--has difficulty in reaching even the simplest kinds of decisions
- ▼ Message garbling--incoherently relays messages, relay contains gaps and may be partly repetitive

*Leadership task performance must be expected to degrade even before many subordinates show signs of degradation*

### Recognizing Serious Degradation: In Yourself

Leadership task performance requires thinking, judging, calculating, determining, recognizing or discriminating (telling apart), and decision making. It is these abilities which degrade most rapidly in continuous operations. Even the strongest will to resist cannot change this. Leaders must face up to the likelihood of their early degradation and to the difficulties of recognizing their own degradation.

Table 1.1 presents examples of how degradation actually shows itself. Leaders must be constantly alert for these signs in themselves. However, self-observation can be unreliable. Either normal tendencies are interpreted to be significant signs, or serious degradation is judged as not yet serious. The judgment of others may be more reliable than your own.

Require staff or subordinates to observe you for signs of degradation. Require them to report their observations to you in objective terms. Ask them to state the exact incident and the observation(s) that led them to judge that your performance shows signs of degradation. Review what has been reported, and judge whether or not it is valid. If valid, act on the indication (see below).

*Learn to recognize stress as well as progressive performance degradation*

### Recognizing Stress

Stress is not unique to continuous operations. Sometimes stress is higher before combat, or when active combat begins, than after some experience with combat. However, fatigue, sleep loss, and disturbed wake/sleep cycles lower resistance to stress. Therefore, the signs of stress in yourself and in others, must be recognized. They are shown in Table 3.1.

### Coping With Stress and Degradation

All soldiers under your control must be aware of and exercise the stress coping skills at their disposal at every reasonable opportunity.

Coping techniques such as relaxation techniques, self-suggestion, meditation, and inoculation must have been practiced and mastered in order to be effective in continuous combat operations. If soldiers have learned to implement the relaxation techniques, or other techniques of this type, they will be able to apply them to good effect. Even in periods as short as 2-3 minutes, beneficial effects can be obtained. Constant application of these techniques will sustain performance.

### Section 4. Rest and Sleep

*Leaders must be the first to comply with the implementation*

### Priorities for Sleep/Rest

Previously developed, unit-specific sleep/rest plans must be implemented.



Table 3.1

The Signs of Stress

In Yourself

Aggression  
Anxiety  
Apathy  
Depression  
Diarrhea  
Dry Mouth  
Fatigue  
Forgetfulness  
"Freezing"  
Frustration  
Guilt  
Hot and Cold Spells  
Inability to Concentrate  
Irritability  
Loneliness  
Low Self-Esteem  
Moodiness  
Nausea  
Nervousness  
Nightmares  
Numbness/Tingling  
Pounding Heart  
Sweating  
Tension  
Urination

In Others

Alcohol  
Denial  
Drugs  
Emotional Outbursts  
Excitability  
Impulsive Behavior  
Inadequate Eating or Drinking  
One Track Thinking  
Restlessness  
Risk Taking  
Smoking  
Speech Disorder  
Trembling

The most reliable remedy for loss of sleep is sleep itself. Sleep loss and its consequences become the dominant problem after the first 48 hours of continuous operations. Therefore, sleep discipline is of prime importance. The following priorities are advisable:

1. Leaders, on whose decisions mission success and unit survival depend, must be given the highest priority and the largest allocation of sleep. Military tradition to the contrary, leaders must have an "extra" share of sleep.
2. The next highest priority must go to soldiers whose responsibilities require them to perform important calculations, make judgments, or evaluate information.
3. A high priority must be given, also, to soldiers who must perform vigilance tasks such as sentries and radar operators.
4. Among the remainder, opportunities for sleep must be allocated as evenly as possible.

*Recognize the need for  
sleep and for trade-offs*

Duty vs.  
Rest/Sleep

Leaders will face the dilemma of deciding between action (e. g., modifying a battle position), and allowing soldiers to rest/sleep. A modified position may be easier to defend, but degraded soldiers will be less able to defend it effectively. There are no rules for making trade-offs. They depend on professional judgment. In each specific case, leaders must evaluate whether additional work or sleep will contribute most to mission success and unit effectiveness.

The evaluation is compounded by the fact that, as continuous operations lengthen, soldier resources shrink, and the effort required to complete each task increases. This applies particularly to leaders and leadership functions. The longer the continuous operations, the greater the importance of recognizing the need for sleep.

*Plan a unit-specific work/rest/sleep discipline for continuous combat operations*

**Work/Rest/Sleep**

In combat, implementation of a unit-specific work/rest/sleep discipline is essential for sustaining effectiveness as long as possible. A plan must be developed for duty rotation and shift-work which will provide the management framework for imposition of the discipline in combat. Test and refine your developed plans in order to assure effective implementation in combat. Design your work/rest/sleep plans and schedules in accordance with the considerations summarized below.

*Implement appropriate work/rest cycles*

**Work/Rest Schedules**

In continuous operations, demands for continuous performance will exist not only for combat troops, but also for combat support and even combat service support units. While combat units may have virtually no control over their work schedules, some degrees of control may remain for the other types of units. When such control can be exercised, adhere to the following guidance. Work schedules are here stated in hours, i. e., "8 on-8 off" means eight hours of work followed by eight hours of rest. "Rest" means principally sleep, or, at least, an absence of duties.

- ▼ For up to five days almost any work-rest schedule (e. g., 2 on-2 off, 4 on-4 off, 8 on-8 off) will sustain performance equally well

- ▼ For up to 30 days follow a 4 on-4 off, or a 16 on-8 off schedule
- ▼ Avoid a 4 on-2 off schedule, if possible

*Preadapt, if possible,  
to required new schedules*

#### Work/Rest Schedules and Wake/Sleep Cycles

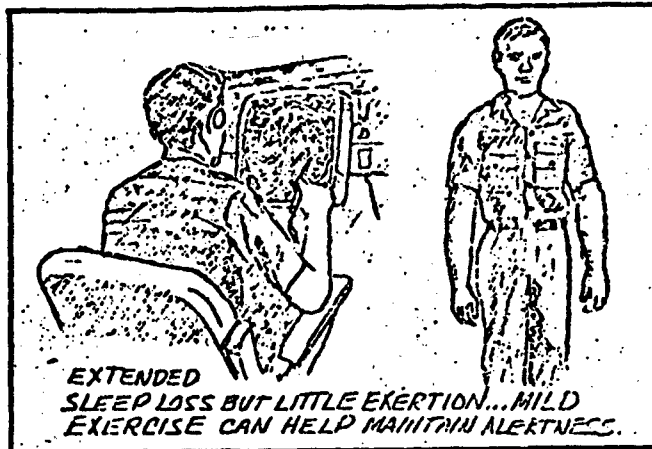
When initiating demanding work schedules, it is also important to achieve adaptation of wake/sleep cycles as quickly as possible. For example, after eastbound flights, it is desirable to begin the work phase immediately. This tends to assure that the soldier will be sufficiently tired to sleep during the off-duty phase. Adaptation will be enhanced, if the individual can synchronize his sleep with the sleep phase of the new schedule as quickly as possible. If possible, establish the anticipated destination work/rest schedule prior to departure. When no time shift is involved, whenever possible, a prolonged work period should be preceded by some 12 hours of sleep and complete rest.

*Sleep discipline must be  
strictly and constantly enforced*

#### Make the Most of Breaks

Assure that all soldiers know how to make the most of their rest opportunities. Emphasize to your soldiers that they waste no time in getting to sleep and that they stay asleep.

Undisturbed and prolonged sleep is the most desirable use of rest opportunities. When extended sleep is not possible, even the briefest "cat nap" can be useful. When cat napping is impractical, resort to relaxation techniques. When there has been mainly sleep loss, but little physical exertion (e. g., manning communications, operating radar), mild physical exercise such as walking around can help to maintain alertness.



### Recovery from Sleep Loss

Use the following guidelines for judging the time required for complete recovery from the effects of extended loss of sleep:

- ▼ As much as 120 hours sleep or rest following 96 or more hours of complete sleep loss
- ▼ 12 hours sleep-rest after 36-48 hours of complete sleep loss with light to moderate workload (subjective fatigue may linger for three days)
- ▼ 24 hours sleep-rest after 36-48 hours sleep loss with high workload (12-16 hours per day)
- ▼ Two to three days time off after 72 hours or more acute sleep loss
- ▼ Three to five days to initiate biological adaptation and return to normal day/night cycle from night shift work
- ▼ Three to four weeks for full adaptation of biological rhythms to atypical work-rest schedules (as in night shift work).

## Task Interest and Complexity

Interest in the activity determines to a considerable degree the extent to which sleep loss will affect performance.

Monotonous tasks, such as searching for targets on a radar scope over several hours, often show performance decrements greater than 50 percent of initial levels. Interest can be raised, for example, by requiring frequent and moderately complicated verbal status reports. Responses to such reports (e. g., requiring clarification, comments on success of performance) also add to interest. Increasing the complexity, in the sense of difficulty (wider sector scan, more screens to watch), reduces performance effectiveness and must be avoided.

## Section 5. Leadership Tactics

### Shift Leadership Style

Shift your leadership style progressively as continuous operations are prolonged and progressive degradation affects every soldier.

Keep in mind exactly how degradation progressively affects each and every soldier. Adjust your leadership style to the conditions of these men. As adverse factors continue to impact, and as sleep loss mounts, soldiers must cope with the effects of degradation (Table 1. 1).

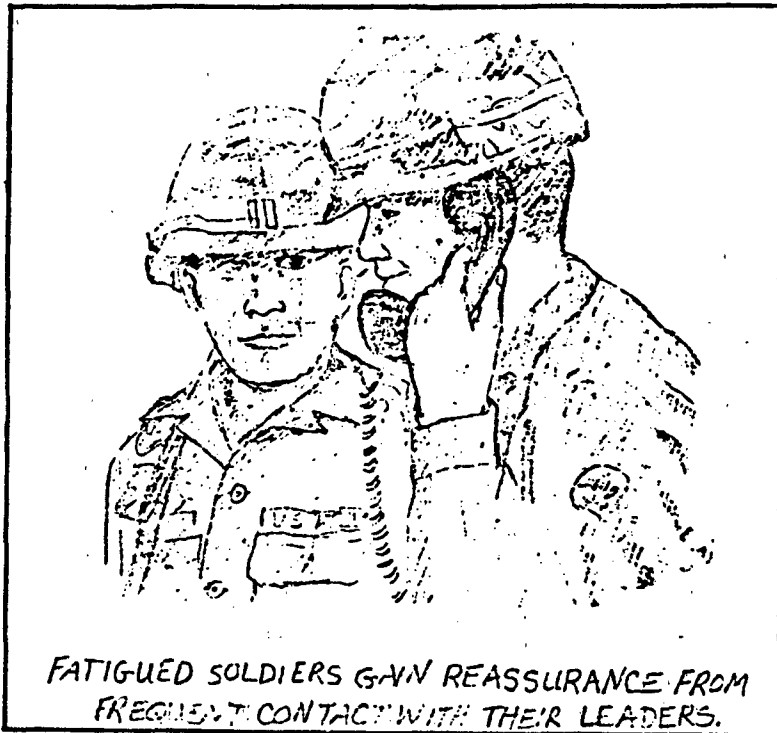
1. Give only simple directions. Soldiers will have difficulty in understanding complicated directions. Their ability to pay attention and to make sense out of what is meant is reduced. If the directions consists of several parts, some are likely to be forgotten.
2. Give complete, clear, and precise orders. Leave no room for interpretation. The degraded soldier has great difficulty in reasoning. He cannot "fill in" anything that has not been said explicitly. He cannot interpret the intent of the order, when that intent is not clearly and completely stated.

3. Repeat all orders and directions. Also, have soldiers repeat the orders given them. Memory for new information will be faulty. Orders or parts of orders are likely to be forgotten almost as soon as given. Therefore, soldiers should write them down. When writing down the order is impractical, have the recipients repeat the order several times.
4. Doublecheck others and yourself. Orders given and acknowledged may not be carried out correctly/completely. Therefore, it is necessary to doublecheck constantly on whether or not orders have been executed as intended. Also, leaders themselves will suffer degradation and should arrange a doublecheck on their own activities.
5. Reassure the soldier. The soldier whose performance has lost its initial effectiveness needs reassurance rather than pressure. He needs firm--sometimes very firm--but patient prodding, but not pressure. He needs to be reassured that he can cope, that he can keep on going, and that he can do what is being asked of him.

Increase  
Communications  
and Cohesiveness

Fatigued soldiers in combat gain reassurance from frequent contacts with their leaders and with their fellow soldiers.

Make contact with as many of your subordinates as often as possible. When personal contact is impractical, make voice contact over available communication channels. On these occasions pass whatever encouraging information can be passed. Also, encourage and praise the soldier as an individual; reassure him.



**Appeal to  
Commitment**

Always reassure the soldier that he, his unit, and his country will prevail. Remind the soldier of his commitment. That commitment can help him to make that extra push that is needed to accomplish the mission when his own resources begin to fail. Also, remind each soldier that every other soldier depends on him just as he depends on them. Winning depends on all soldiers together performing beyond what each believes possible until the mission has been accomplished.



## CHAPTER IV

### ORGANIZATION AND PREPARATION

#### Section 1. Developing a Continuous Operations Capability

##### **Program Integrity**

In order to explain the strategies and tactics for reducing the impacts of adverse conditions in continuous operations, they were introduced separately. However, the development of a genuine capability for sustained, effective performance depends on maintaining the integrity of the entire program. The program is not a menu from which appealing items can be chosen, because the strategies and the tactics are interdependent. For instance, task rotation is possible only when crosstraining has taken place. The degradation countermeasures are, also, mutually reinforcing. Cohesion, esprit, and commitment develop in a consistent program of training and preparation. Only an integrated program will develop the sustained effective performance required in continuous operations.

##### **Time Frame**

The tactics discussed in Chapter III flow directly from and depend on the strategies presented in Chapter II. A time frame exists for the development of effective performance in continuous operations. Each of the strategies and tactical measures fits into a particular portion of this time frame. Conscientious and effective preparation are required.

There is also a larger time frame. In this time frame, the initial objective is to build the capability for long-lasting combat effectiveness to the highest level that can be achieved. Months are required to develop solutions and to prepare units for their use. During a brief mobilization period, the objective becomes one of honing the developed counterdegradation tactics to a fine edge. Once the continuous battle is imminent or actually begins, the objective changes again to conserving soldiers' performance capabilities and to expending them as slowly as possible. This is the time to apply the counterdegradation tactics.

## Section 2. Managing the Preparation

### Inform

Make clear to every soldier in your unit the purposes of continuous operations training and the objectives to be achieved. Soldiers must be led to understand clearly the nature of the continuous operations challenge and why the training preparation for it is necessary, i. e., how achievement of the continuous operations capability will benefit them on the battlefield.

A genuine unit capability for sustaining effective performance cannot be developed without the active cooperation of the individual soldier. To cooperate fully, he must be aware of all requirements and he must appreciate their importance. He must become committed to the purposes of preparation, and this depends upon an understanding of the necessity for it.

Therefore, explain the expected conditions in continuous operations, the adverse effects on soldiers' performance, and how the prospective training will help to sustain performance. Do not expect immediate comprehension and acceptance. Repeat the explanations as progressive training permits the soldiers to relate them to their own experiences.

### Determine Critical Mission Elements

Strive for the highest sustained capability for the critical elements of your unit's most important missions. All missions your unit may be assigned are not of equal importance and within each mission, all elements are not of equal importance. Sustained effective performance in highly critical tasks is of greater importance than performance in tasks on which mission success(es) depend(s) to a lesser degree. Prepare for a peak of sustained effectiveness in the most critical tasks in the combat missions of your unit.

Systematically list the important combat missions your unit is likely to be assigned. Within each type of mission, determine the tasks (and the duty positions who carry out these tasks) on which mission success primarily depends. Verify your initial judgment by systematically considering for each task the consequences of failure, or of inadequate performance (e. g., insufficient accuracy, failure to detect some proportion

of targets). Refine your list. Primarily focus preparation for continuous operations on the missions, tasks, and personnel judged most important on your final, refined list.

### Know Your Men

"Inventory" your soldier assets and liabilities (weak links) relative to the major missions and their critical tasks.

When you have determined the critical missions and tasks, take stock of your assets for accomplishing them. Identify personnel with special talents relevant to particular, critical mission elements. Also identify those who constitute liabilities (e. g., easily disoriented, slow to spot targets) so that critical roles will not be assigned to them and if possible, so that they can be trained to overcome these liabilities.

Also, take stock of the current level of performance capability in your unit. Compare the current level of performance by each soldier or team to that which will be required for sustained unit effectiveness in continuous operations. Discrepancies will become the basis for your preparation/training program.

There are several ways in which soldier assets can be determined efficiently. Existing records (e. g., personnel files) can be reviewed. This information can be refined and supplemented through interviews with soldiers, their team mates, and with their immediate supervisors. Best of all is direct, objective observation of critical task performance. Such observations are most useful when records are kept so that trends of improvement can be plotted.

### Plan/Prepare

Now plan the training and other preparation required to bring existing performance capability into balance with requirements for critical combat tasks. In Chapter II, the strategies for reducing these discrepancies were described:

- ▼ Leadership
- ▼ Training
- ▼ Physical Conditioning
- ▼ Dedication and Commitment
- ▼ Resource Management.

Fit these strategies to the specific requirements of your unit. Remember that these strategies were designed to develop the tactical options described in Chapter III for sustaining performance in continuous operations:

- ▼ Task Restructuring.
- ▼ Task Rotation
- ▼ Work/Rest Cycles
- ▼ Sleep Discipline
- ▼ Performance Supports
- ▼ Stress Management,
- ▼ Leadership Style

Use these tactics as guide marks in planning your unit's preparation.

### Implement the Program

Implement the unit preparation and training program as a series of increasing challenges.

While a sudden, full-scale continuous FTX would graphically demonstrate the resulting performance degradation and may convince skeptics of the necessity for the training, this approach to training is not recommended. Soldiers are not yet prepared to cope with extreme adverse effects and might come to doubt their potential capability for continuous operations.

Physical conditioning provides the stamina needed to endure the tough demands of continuous operations. Physical conditioning can be implemented immediately since it does not require any prior technical skills. Along with leadership and commitment, physical conditioning builds the foundation for continuous operations training.

Each soldier must learn to resist stress--to control it and to reduce it when it threatens to overwhelm him. In continuous combat operations, or even in continuous FTXs, stress control techniques can be used. However, these techniques must be practiced repeatedly to become automatic for each soldier, and to produce the desired effect quickly. Provide opportunities for such practice and encourage it.

## **Evaluate the Program**

Evaluate the preparation plans and the training program throughout their implementation.

A rigid adherence to an initial program design is likely to be neither effective nor efficient. It is advisable to evaluate the program as it is introduced, and to assess its shortcomings as well as its effectiveness. Determine the features of the program that work well, those that can be improved, and those in need of revision.

Conduct frequent after action critiques not only for the benefit of teams and soldiers, but also to determine program shortcomings and to solicit recommendations for improvements. Adjust and readjust the program to fit the unit more precisely, and to increase efficiency.

Use the information from preceding evaluations, observations, and suggestions to adjust and refine the program. In particular, adjust unit procedures so that they work smoothly in difficult training exercises when the performance of all soldiers in the unit has become degraded.

## **Conduct Continuous Operations Exercises**

Provide practice for the unit in increasingly realistic continuous operations.

Begin continuous operations training with exercises of moderate duration (24h-48h) and with some, but not all, adverse conditions present. Concentrate training and practice on the previously identified critical mission elements. Where possible, repeat selected segments of continuous exercises so as to afford participants the maximum of practice on their most critical tasks. As each soldier in the unit learns to cope with the adverse conditions and to stay effective, increase the severity of the conditions.

Ultimately, train as you expect to fight. Train for the worst conditions the unit may encounter in combat. Progress to this stage as proficiency grows.

## **Assess Progress**

Monitor progress of the unit toward its continuous operations capability; also, verify that achieved capabilities are maintained.

Apply ARTEP standards to unit performance in continuous FTXs. Eventually, assess the unit's performance in the worst combination of adverse circumstances you can achieve. When effective performance can be sustained over extended periods, the objectives of continuous operations preparation/training have been achieved. However, continued monitoring and continued training will be necessary to maintain the capability at the achieved level. Replacement personnel will require special attention to bring them "up to speed."

Revise  
and Refine

Continue to revise and refine the unit's program, and strive for greater and greater capability.

Programs of preparation, strategies, and tactics to counter degradation of performance in continuous operations can vastly improve performance. However, human psychophysiological limits will prevent any unit from ever being prepared to cope totally with the worst sustained combat conditions it might encounter. Constantly search for ways to improve the capability of your unit for effective performance to a higher level and for longer periods. This is a responsibility for all levels of leadership in the unit.

## CHAPTER V

### SUMMARY OF PRINCIPLES FOR COUNTERING EFFECTIVENESS DEGRADATION

The strategies and tactics for countering effectiveness degradation may be summarized in terms of a set of principles. This chapter presents these principles in summary forms.

#### Section 1. Strategic Principles

Show, by example, how every soldier in the unit must conduct himself; at all times demonstrate leadership of the highest order

Beginning with the preparation and training to develop a genuine continuous operations capability, every soldier is called on to draw on every resource at his command. Continuous operations and the training for it are the most demanding missions any soldier can be assigned. The requirements go beyond physical endurance. They test each soldier's will to push himself beyond the utmost limits of his endurance, and to perform his duties even when he no longer believes it possible to go on. The strength to continue feeds on the leadership the soldier has learned to expect and on his own devotion to the standards that have been consistently demonstrated to him.

Concentrate soldier resources preparation on tasks that are important to combat missions.

All tasks, even combat tasks, are not equally important to successful mission accomplishment. Mission success depends most on effective performance of certain tasks. Emphasize these in training and cross-training.

Analyze required effort(s) accurately and in detail; effective planning and efficient soldier resources management depend on it.

When soldier resources become a critical factor, requirements need to be examined and precisely defined. What sort of personnel is required? How well must each duty position perform? With expected degradation of effectiveness, will critical combat tasks be performed adequately? Prepare for continuous operations.

Know your unit, the strengths and weaknesses of everyone in it, and the true status of current capabilities.

With an accurate picture of the unit and of its performance capabilities, effective planning and matching of requirements are possible. Assess capabilities. Assess individuals and teams, and know what they can do when pushed to their limits as well as when rested.

Identify the weak (soldier and task) links, and strengthen them.

Creating a highly proficient unit that remains effective long into continuous operations calls for constant diagnosis of strengths and weaknesses in its personnel. Whether the weakest link is a task or a soldier carrying out the task, identify it and implement constructive, strengthening action. The fewer the number of weak links and the less the weakness of any one link, the longer is a unit able to function usefully (with, at least, some effectiveness).

Identify key personnel for key roles in various types of missions.

Soldiers differ in all important characteristics: skills, competence, speed, and various mental abilities. In anticipation of various requirements in continuous combat operations, the best qualified soldiers need to be identified. Use personnel files to furnish information



about special skills and unusual competence. Use tactical training exercises to evaluate important capabilities (for example, target detection, terrain orientation) and to preselect personnel for potential key roles. Also identify the soldiers who are least suited for these roles.

Do not rely on the performance capability of only a few key individuals. Such a policy is dangerous, and impractical. In continuous operations, it must be possible to rely on everyone to perform as required.

In combat, any soldier may become a casualty. However, even if he does not become a casualty, his performance may degrade below even minimal adequacy. In either case, fatigue may prevent him from contributing the required skills. Especially in continuous operations, a back-up performance capability is essential. Therefore, do not rely on a policy of maintaining the best man for the job at all times.

Use performance records to form a basis for guiding soldiers and teams to high proficiency.

The expected conditions of continuous combat operations demand the utmost capability and endurance from every unit, team, and soldier. ARTEP evaluations set only minimum acceptable performance standards. Performance files document current levels of competence, permit the setting of goals for improvement, and verify trends of improvement (or lack of it). Performance records are also diagnostic tools for pinpointing individual or team deficiencies.

Make the unit's goals clear to every soldier in the unit, and relate his own goals to them.

Guide and relate personal performance goals to unit performance. Make each soldier understand how his performance and his goals relate to his unit's goals. This understanding contributes not only to effectiveness but also to cohesion. Achievements become personally meaningful when they are seen in relation to common objectives. Loyalty to close associates and pride in a soldier's unit are strong incentives to achieve excellence.

**Develop effective leadership authority.**

Leadership is one of the most important factors for maintaining effective combat performance. It is especially important under stressful conditions such as during continuous operations. Formal leadership authority is established by military rank and assigned role. Informal leadership authority comes from repeated demonstrations to subordinates that the leader best knows what to do at all times. Rank does not automatically confer informal leadership authority. Truly effective leadership authority combines formal and informal leadership. The leader who has established his authority is recognized as best able to make decisions, and as willing to enforce them.

**Encourage soldiers in the unit to examine their commitment to its goals and to their fellow soldiers in the unit.**

Allegiance to his unit, commitment to its purposes, and loyalty to his fellow soldiers can exist even when a soldier is not aware of them. Remind each soldier in the unit that all others depend on him to do his part just as he depends on all others to do theirs.

**Open channels for upward, downward, and lateral flow of information.**

Once a unit is in active and continuous combat operations, deficiencies can no longer be corrected nor weaknesses shored up. For effective leadership in combat and for estimating what can be done and for how long, full and unvarnished information is required. The leader must know the true state of affairs and in precise detail. Often informal channels provide such information.

**Develop a program of physical conditioning for the unit that is designed to create the strength and the physical stamina that are needed in continuous operations.**

In continuous combat, many different, extraordinary physical demands will be made on every soldier. His body must be fit to meet the demands. Jogging and certain calisthenics, for example, help to develop stamina (endurance), but not necessarily the strength to lift, dig, or push. Any or all of these capabilities may be needed. Aerobic fitness helps to ward off the moodiness that comes with physical exhaustion, and helps soldiers to stay fit mentally. Build up to a peak of fitness for every conceivable purpose.

**Develop and implement a stress management program.**

Stress, as it impacts on the soldier and on his performance, can be counteracted. The means for counteraction, for the most part, must be developed. These developments cannot take place on the spur of the moment in battle. They must be prepared well in advance. Overall stress and counterdegradation discipline requires practice until it becomes second nature.

**Plan and implement a realistic, long term program of continuous operations training exercises.**

High and reliable combat performance depends on thorough prior training. Performing any task when rested and under favorable conditions differs greatly from performing it when fatigued (especially, with loss of sleep) and under adverse conditions. Practice all important tasks in environments and conditions as close to continuous combat operations as possible.

Review task performance vulnerabilities as a key for training, and especially crosstraining priorities.

Time and resources are always limited. Within these constraints, place the highest continuous operations training priorities on those tasks which are most critical and are expected to degrade most. These are the combat activities for which it is most important to slow the rate of decline in effectiveness.

Use FTXs to diagnose factors needing leadership attention; evaluation is not an end in itself.

Give leaders and evaluators at all levels wide latitude and encouragement to ensure that the long range goals of continuous operations training (i. e., performance in combat) are attended to as well as the specific "indicators" designed to quantify readiness. Random selection of personnel, tasks, and vehicles, as well as the use of a large number of personnel from a similar unit as evaluators constitute a step in this direction. Develop adequate evaluation tools.

Use ARTEP based evaluations to diagnose deficiencies for combat operations rather than as performance criteria in themselves.

Viewing the performance standards published in ARTEP outlines as the "desirable" level is dangerous. The consequences of such a policy will become clear only in actual continuous combat operations--when it is too late. ARTEP performance standards must be achieved and maintained, also, under continuous operations conditions. Make evaluations diagnostic for subsequent, further improvement. View ARTEP standards as suggesting minimum acceptable proficiency, but not peak or desirable proficiency.

**Accept mistakes, but do not permit them to be repeated.**

Establish policies which offer incentives leading toward unit effectiveness rather than toward individual benefit (no deficiencies admitted). Subordinates should understand that the ability to learn from mistakes is valued. However, they must also understand that immediate corrective action is required. Openness about mistakes and a spirit of constructive criticism support unit morale.

**Emphasize the importance of soldiers teaching soldiers how to achieve a peak of proficiency.**

By virtue of their rank and position, senior NCO's have many administrative and supervisory responsibilities. They also possess a responsibility for teaching others. Prior to combat, experienced personnel are most constructively utilized in training less experienced soldiers in the fine points of combat skills. In general, soldiers can be effective instructors of their fellow soldiers.

**Train leader positions at all levels.**

The management and conservation of soldier resources represent crucial problems for all levels of leadership. Accordingly, leaders must be fully knowledgeable about human performance, its degradation, and how to control it. Informal development of this knowledge cannot be relied on. This training is essential for every level of leadership. The human factors that must be considered in mission planning and execution must be thoroughly understood before such training can be accomplished.

**Use constructive, purposeful, and combat relevant training activity to build morale.**

Morale, motivation, cohesion, and leadership sustain soldiers in combat and bolster their performance. So long as the objectives of training are well understood by every soldier in a unit, the training serves the same

purposes. Wholehearted participation by the trainees makes for very effective performance. Participation toward a common accepted purpose, especially with progressive achievements, builds morale and strengthens unit cohesion. The cohesion itself then becomes an incentive to achieve excellent performance.

**Plan training exercises carefully, because practice does not always make perfect.**

Mere repetition of task performance does not guarantee improvement. Diagnostic guidance on how to improve--what is wrong and how to correct it--is required. Emphasize in practice: (a) what has not yet been mastered sufficiently, and (b) what may be fading due to disuse (forgetting). Make practice progress from the "easiest" to the most "difficult" circumstances of task and mission performance. Design training to include as many aspects of combat performance as possible and include practice under realistic circumstances. For example, realistically simulated potential conditions (masks, protective gear, decontamination, etc.) must form part of the practice.

**Overtrain on all combat tasks, because it will pay dividends in continuous operations.**

Training beyond basic, initial task mastery produces automatic, rapid, and reliable performance. When a soldier can perform a task "with his eyes closed" and "with one arm tied behind him," he will be able to do it when conditions force him to perform in just such ways. When performing each task of his job has become "second nature" to him, the soldier's performance becomes extremely resistant to degradation. His performance under difficult conditions (while extremely fatigued, and in the stress of battle) stays effective for a longer time than it would with a lesser amount of practice.

Emphasize extensive crosstraining.

If each soldier were crosstrained with every other soldier in a unit, rotation and echeloning would present no problem. Crosstraining provides insurance that someone is available to perform each critical task at each critical time. Crosstraining is accomplished efficiently through the peer (soldier-to-soldier) instruction technique. "Teach back" is an effective technique in crosstraining. It means that after the trainee has grasped the task, he explains and demonstrates the task to the instructor. Feedback of information about correct and incorrect aspects of performance, praise, and recognition of individual achievement also help learning. After substantial crosstraining has taken place, arrange for routine rotation of roles (switching of duty responsibilities) during exercises.

## Section 2. Tactical Principles

Remember that mental fatigue is the critical problem in continuous operations.

Mental fatigue is the result of sleep loss, disturbed waking/sleeping cycles, and combat stress (noise, cold, fear, uncertainty, conflict). Unlike physical fatigue, mental fatigue progressively exhausts the resources for resisting it. Sleep is the only effective remedy for its prolonged loss. Sleep is also an absolute necessity for the brain (nervous system). When a soldier is deprived of sleep, his mental functioning deteriorates, and all mental processes dependent on that functioning also deteriorate.

Consider physical fatigue, but only as a secondary problem in any extended operations.

Physical fatigue is primarily an exhaustion of muscles. There is almost no limit to the physical fatigue that can be endured by physically conditioned soldiers; the body constantly adjusts, recuperates, and recovers strength. Even with very little rest, a fair level of physical (motor) performance can be maintained almost indefinitely.

Sleep (up to 12 h) before the start of continuous operations.

If soldiers have just finished sleeping when they begin continuous operations, the onset of serious sleep loss effects will be delayed. There may be few, if any, effects over the first 24 hours. Thereafter, performance will be maintained at a higher level and for a longer time than when soldiers begin continuous operations after having been awake for 8-10 hours.

Synchronize, wake/sleep cycles with the combat zone's local time as early as possible.

Relocation from CONUS to a battle area (across a number of meridians) causes the normal wake/sleep cycles to be out of phase with local time. Soldiers will be at their personal, biological "low" in the early and middle part of the day. This will aggravate sleep loss effects and further diminish effectiveness. Therefore, try to adopt wake/sleep cycles matching the battle zone time as early as possible so as to achieve biological adaptation as soon as possible.

Look for unreliability or unevenness of performance as well as declining effectiveness.

Some of the performance variability after sleep loss is somewhat predictable. Morale, stamina, and the will to keep going are lowest between 0200 and 0600, though, at other times, too, sleep loss has a negative effect on soldiers' moods; soldiers become depressed, irritable, unreasonable. Other kinds of variability are unpredictable. Differences in the ability to maintain effectiveness after sleep loss are unrelated to intelligence or personality. The effectiveness of a given soldier in a given task at any time is the most unpredictable. Generally, fatigued and pressured soldiers will try to maintain performance on their primary task at the expense of secondary tasks--performance of a secondary task is omitted or is perfunctory. Fundamentally, "waves" of fatigue impact on each soldier and his performance varies accordingly. For example, a fatigued soldier posted to detect enemy infiltrations remains alert only some of the time. The proportion of alert time shrinks



with increasing fatigue; the increasing fatigue and the incidence of the lapses cannot be predicted. Posting men in pairs raises the probability of detection, because the lapses of the two soldiers are not likely to coincide. Mild physical activity (walking around) helps to keep men awake and increases alertness.

**Keep leaders as clearheaded as possible, success and survival in continuous operations depends on them.**

During continuous operations every moment that can possibly be spared should be used for sleep for anyone and everyone, and, if possible, for undisturbed sleep. However, leaders who must do the thinking and decision making, need the largest allotment of sleep. Unit effectiveness and survival are unlikely without effective leadership. Possibly the most important part of leadership preparation for continuous operations is to preplan arrangements that will allow leaders to rest and sleep in combat.

**Mix (more) rested with unrested men in continuous operations; echelon partially when whole unit replacement is not feasible.**

Although preferable in principle, unit replacement may not be possible in continuous operations. Rested, or partially rested soldiers can substantially improve the effectiveness of a degraded unit. Crosstraining bears on this possibility.

**Make orders clear; repeat them.**

Leaders not only formulate plans, but also guide their execution. Their orders must be clear, concise, and complete. Fatigued soldiers are no longer able to interpret, or even understand, orders intelligently. After 36 to 48 hours of continuous combat, orders need to be very simple, concise, and leave no discretion to recipients. Leadership style must shift in the direction of patient, but firm, authoritative directions as fatigue makes soldiers numb, passive, and reluctant to act. Leaders themselves should be aware that the

time needed to communicate information increases. Parts of a message may be missed and the omissions may not be noticed. Therefore, repeated verbal messages, have another soldier listen in, and require repetition of the message from the recipient(s).

#### **Leaders must rest!**

Leaders often regard themselves as least vulnerable to sleep deprivation and to the other adverse effects of continuous operations. In fact, the tasks they perform are the most vulnerable. The fatigue from loss of sleep most depresses the ability to think clearly, solve problems, assess the consequences of a course of action, and make good decisions. It also depresses the ability to make sense out of things that are seen or heard, or to relate separate items of information. Once fatigued, leaders cannot react quickly to unexpected events or cope with complex situations. Therefore, problems and solutions need to be anticipated. Allow leaders, who must keep a clear head, all the sleep that they can possibly get.

#### **Soldiers should rest!**

While leaders must rest, soldiers should rest and cat nap at every opportunity. Remember to give the priority to those who must perform calculations, make judgments, or evaluate information. Give a high priority, also, to soldiers required to remain vigilant such as sentries and radar operators. Allocate sleep to all others as evenly as possible.

#### **Make all statements with assurance and authority.**

The way in which facts are stated can be as critical as the facts themselves. An authoritative statement made in a tone of voice that carries conviction leaves no room for doubt. A display of self-assured leadership reassures the soldier. It sustains his will to keep going.

**"Accentuate the positive."**

Strive for positive, hopeful ways of expressing yourself as a leader. To the maximum extent possible, use words and phrases with an active, constructive connotation. Maintain an atmosphere that signals determination to succeed. Choice of words as well as tone of voice carry a vitally important message for the soldier at the edge of exhaustion.

**Pass as much information as possible through the ranks.**

Pass on down through the ranks, to every foot soldier, all security-free items of information reaching you. Soldiers take comfort from knowing what is happening. They are able to see their role and their contribution in relation to them. Also, frequent communications maintain their sense of community with the unit and with its leadership. Both effects help to sustain a soldier's determination to persist and to succeed.

**Exhort and encourage at every opportunity.**

Continually spur on every soldier in your unit to make the extra effort that will lead to mission accomplishment. Reassure soldiers that the mission will be successful. Express your belief in their ability to achieve success. Tell them they are doing well and emphasize achievements so far. Sustain a winning spirit.

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**APPENDIX A**

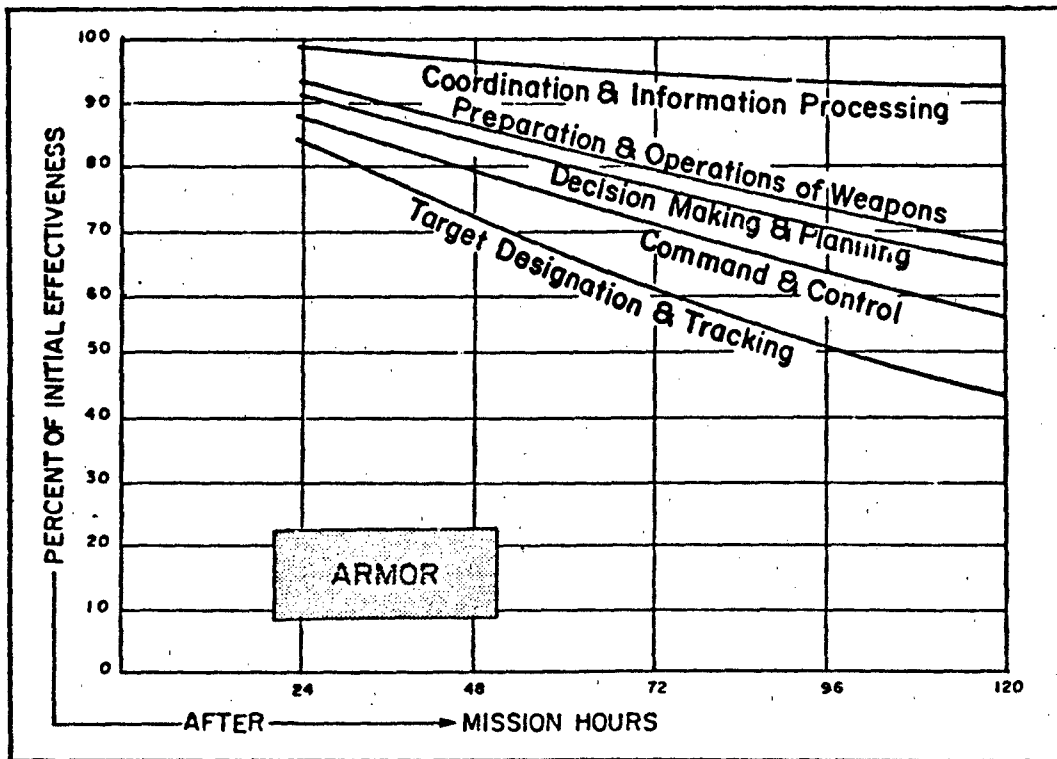
**PERFORMANCE DECREMENT BY COMBAT ACTIVITY CATEGORY**

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The types of combat activity shown in the graphs which follow were established through a mathematical technique for examining the critical abilities required for important combat tasks.

Degradation of Types of Combat Activity for Army Units

The following graph shows the projected decline in the performance of Armor Units.



Performance decrement by combat activity category for Armor\*.

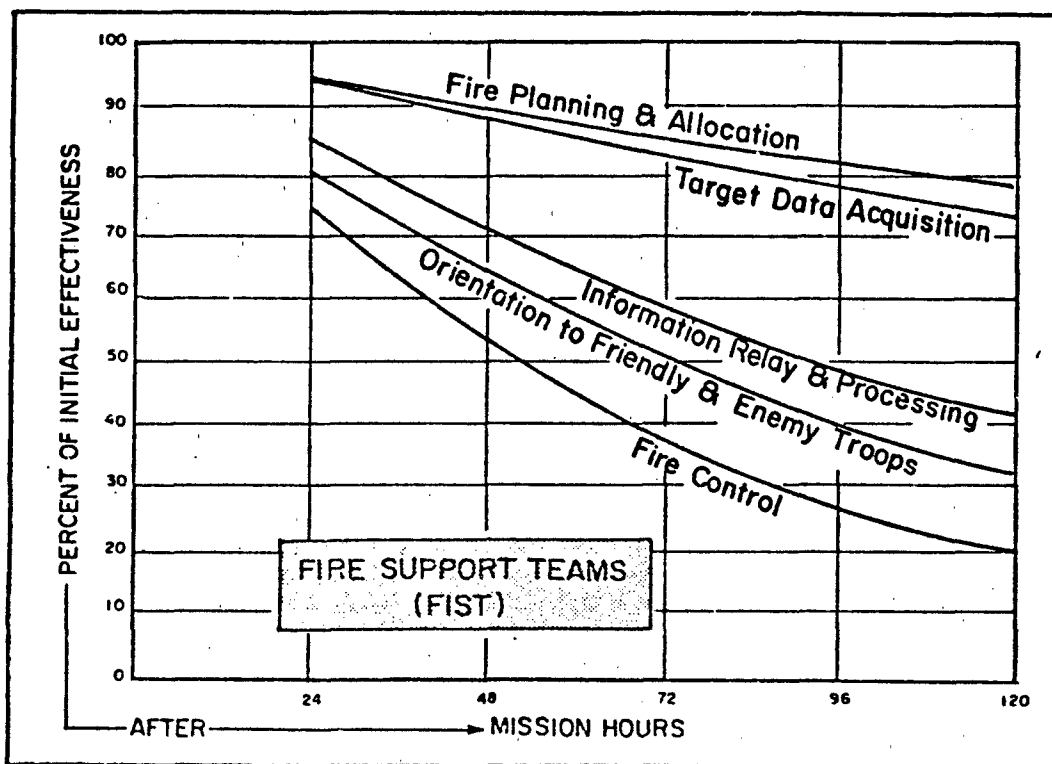
\*Projections based on computer simulations, and found to agree with studies of continuous military performance.

Highly practiced and purely physical activities suffer least. Some examples of combat tasks representative of each category are:

- ▼ Coordination and Information Processing-- coordinate with ARTY FO, report enemy sightings, control driver actions when moving
- ▼ Preparation and Operation of Weapons-- fire maingun, load COAX MG, operate breech mechanism
- ▼ Decision Making and Planning--select firing positions for tanks, supervise defensive preparations, issue spot reports
- ▼ Command and Control Activity--prepare platoon fire plan, control formations on the move, issue fragmentary orders
- ▼ Target Designation and Tracking--acquire targets, operate laser range finder, track targets.

Degradation of Types of Combat Activity for FIST

The following graph shows the projected decline in the performance of Fire Support Teams (FIST).



Performance decrement by combat activity category for Fire Support Teams (FIST)\*.

\*Projections based on computer simulation, and found to agree with studies of continuous military performance.

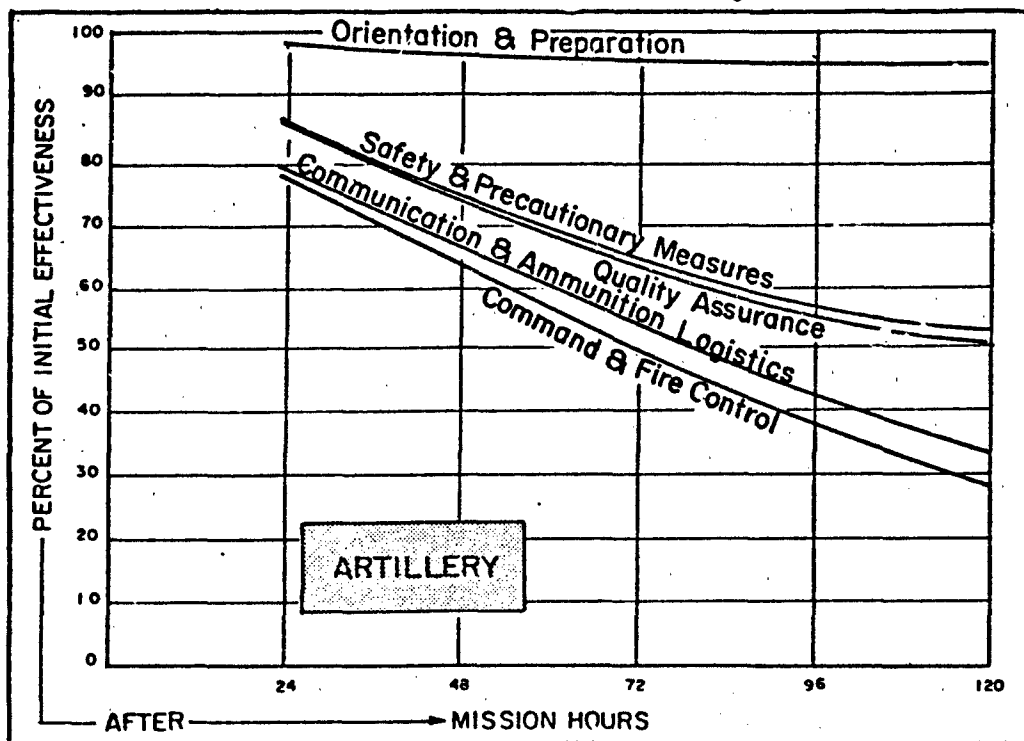


Some examples of combat tasks representative of each category are:

- ▼ Fire Planning and Allocation--receive orders and plans from TM CDR, approve FO calls for fire, redirect FO calls for fire
- ▼ Target Data Acquisition--operate laser locator/designator, determine range of target, determine direction of target
- ▼ Information Relay and Processing--relay calls for fire, receive plans and orders from FIST chief, operate field telephone
- ▼ Orientation to Friendly and Enemy Troops--select observation posts, orient for direction, determine exact position on the ground
- ▼ Fire Control--adjust various types of fire, engage targets of opportunity, determine when to request end of mission.

Degradation of Types of Combat Activity for Artillery

The following graph shows the projected decline in performance for 155 mm Artillery units.



Performance decrement by combat activity category for Artillery\*.

\*Projections based on computer simulation, and found to agree with studies of continuous military performance.

Some examples of tasks representative of each category are:

- ▼ Orientation and Preparation--lay the weapon, refer the piece, orient a map with a compass
- ▼ Safety and Precautionary Measures--ensure that weapon is properly emplaced, select aiming points for gunner, order when to boresight
- ▼ Quality Assurance--ensure sections store, segregate, and protect ammunition, ensure that weapon is ready for action, identify fuzes and fuze wrenches by type
- ▼ Communication and Ammunition Logistics--lay communications wire to FDC, store ammunition at a cannon position, prepare propellant charge
- ▼ Command and Fire Control--control fire of the battery, order azimuths marked, measure and report site to the crest.