Mending the Seams in Force Protection: From the Pentagon to the Foxhole

Col. Roland J. Weisser, Jr.
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Disease and nonbattle injuries are major causes of attrition in an armed force. Army doctrine lists four dynamics of combat power: leadership, firepower, maneuver, and protection. As the bulwark against DNBI, protection includes four components that address operations security, maintenance of health, morale and equipment, safety, and avoidance of fratricide. Unfortunately, protection programs have evolved in a piecemeal fashion to address new problems, emerging technology, or through forceful proponents building empires. As a result, there is a multitude of fragmented programs with the aggregate of the whole rarely being focused on a given problem. The author advocates a seamless protection program entitled "Environmental Security" with consolidation of all the components under a deputy Chief of Staff, Environmental Security (DCS(ES)). The author concludes by recommending a program to market and implement the concept.

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Abstract

Disease and nonbattle (DNBI) injuries are major causes of attrition in an armed force. Army doctrine lists four dynamics of combat power: leadership, firepower, maneuver, and protection. As the bulwark against DNBI, protection includes four components that address operations security; maintenance of health, morale and equipment; safety; and avoidance of fratricide.

Unfortunately, protection programs have evolved in piecemeal fashion to address new problems, emerging technology, or through forceful proponents building empires. As a result, there is a multitude of fragmented programs with the aggregate of the whole rarely being focused on a given problem. This is compounded by the complexity of "stovepipe" chains of command which impede the horizontal integration of data and contribute to duplicated efforts.

The author advocates a seamless protection program entitled "Environmental Security" with consolidation of all the components under a deputy Chief of Staff, Environmental Security (DCS-ES). This structure would emulate the structure of the Army Secretariat, Deputy Assistant Secretary of the Army - Environment, Safety, Occupational Health (DASA(ESOH)). The DCS-ES would be expected to consolidate protection programs and implement the appropriate changes in leadership, staffing, proponency, organization, and training. The author concludes by recommending a program to market and implement the concept.

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The views presented in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies, nor any of the persons, institutions, or staff cited above.

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List of Acronyms

ACS(IM): Assistant Chief of Staff – Installation Management

AMEDDC&S: Army Medical Department and Center and School

AR: Army Regulation

ASA(IL&E): Assistant Secretary of the Army (Installation, Logistics, and Environment)

ASD-HA: Assistant Secretary of Defense-Health Affairs

ASI: Additional Skill Identifier

ASP: Army Safety Program

DASA (ESOH): Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health)

DCS-ES: Deputy Chief of Staff - Environmental Security

DCSOPS: Deputy Chief of Staff for Operations and Plans

DNBI: disease and nonbattle injuries

DoD: Department of Defense

ESO: Environmental Security Officer

HAZMATS: hazardous materials

LOGCAP: Logistics Civil Augmentation Plan

MEDCOM: U. S. Army Medical Command

MOS: Military Occupation Specialty

NBC: Nuclear, biological, chemical

OPLAN: Operations plan

OPSEC: Operations security

OSHA: Occupational Safety and Health Act

PEL: Permissible Exposure Limits

POI: Programs of Instruction

STRAP: Structured Requirements Analysis Planning group

TRADOC: U.S. Army Training and Doctrine Command

TSG: The Army Surgeon General

UECO: Unit Environmental Compliance Officer

USACHPPM: U.S. Army Center for Health Promotion and Preventive Medicine

USACHPPM-EUR: U.S. Army Center for Health Promotion and Preventive Medicine-Europe

USACMLS: U.S. Army Chemical Center and School

USAES: U.S. Army Engineer School (USAES)

USD-PR: Under Secretary of Defense-Personnel and Readiness

1. Introduction

1.1 Case Study

On 7 July 1997, Major General Robert Scales, then Deputy Chief of Staff for Doctrine at the U.S. Army Training and Doctrine Command (TRADOC) presented a Pentagon briefing on the concept of the Army After Next. During the briefing, he introduced the term "convergence" and constructed an analogy with the biological sciences through which a number of observers begin discussing a "phenomenon from many different directions, and as (they) investigate ...(they) move toward a single scientific law that gives (them) some confidence that (they are) about right...they certainly agree with the principle, all of them do."[1] MG Scales then explained that our Army will always be heterogeneous but for success, we need parts that:

> ...are built together and operate together so that there are no seams. Seams mean risk. Risk means attrition. Attrition means protracted war which means high casualties which means stalemate which means that we lose.[2]

Scales then went on to relate a specific incident in detail:

> *The winter of 1997-98 was typically cold in Bosnia To ensure that soldiers had warm quarters, the Logistics Civil Augmentation Plan (LOGCAP) contractor procured a variety of heaters outside the Army supply system because the commercially available heaters 1) were more readily available than heaters in the Army supply system, 2) did not require outside venting, 3) required less maintenance, and (4) were one third to one fifth the cost of the standard Army issue heaters*

Since AR 420-90 (Fire and Emergency Services) forbids the use of any heating device that was not Army issue, the contractor requested a safety evaluation on which to base a request for a waiver of the regulation The EUSAEUR Army safety community performed the Safety evaluation and confirmed that the heaters were not a safety hazard, (i.e. did not tip over, were self-extinguishing in the event of a tip over, and did not require sophisticated maintenance) The results of the safety evaluation were reported through the safety chain of command Subsequently, the contractor was granted an "exception of policy" under AR 420-90 and the stoves were put into service

In January 1998, the Under Secretary of the Army received a letter from the Chairman, U S Consumer Products Safety Commission (CPSC) reporting that soldiers in Bosnia were complaining of morning headaches and nausea The letter went on to express concerns about the safety of the kerosene heaters that were in use and intimated a possible connection with the soldier complaints

Following receipt of the letter from the CPSC, the U.S Army Center for Health Promotion and Preventive Medicine-Europe (USACHPPM-EUR) was requested to perform an air quality assessment in quarters where the stoves were used. An Industrial Hygiene (IH) evaluation showed that the air quality was in compliance with the Occupational Safety and Health Act (OSHA) Permissible Exposure Limits (PEL), and, the American Conference of Government Industrial Hygienists (ACGIH) Threshold Limit Values (TLV)

At this point, the Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health) (DASA (ESOH)) assumed personal control of the investigation into the soldier complaints. During this review, it was reaffirmed that there was no "safety hazard" and that the testing on the ambient air was acceptable for "carbon monoxide, petroleum hydrocarbons, nitrogen dioxide (and) particulates."

However, the review also determined that the fuel that was used in the stoves had been procured from an Air Force supply point. While it was the proper type of fuel (K-1/JP-8), the fuel also contained locally added anti-icing, corrosion, and anti-static addictives Since the presence of the additives was unknown at the time of the original testing, no air quality tests were conducted to determine harmful combustion products from the additives

Further testing is now underway to determine whether or not any other potentially harmful combustion products which could contribute to the soldier symptoms of morning nausea and headache may be generated from JP-8 fuel containing the additives is burned.

2. Overview

Like the proverbial tale of the blind men inspecting an elephant, the case study illustrates how the tendency to attack any problem is framed by the interest, experience, and capability of the observer. In this case, the observers framed the problem in terms of the specialties of safety and industrial hygiene, and each came up with a "correct answer." It was not until the DASA (ESOH) became involved with the overarching perspective of soldier health as the concern that a potential threat was discovered. Luckily, in this instance, no soldiers appear to have suffered any serious consequences and the stoves have been vented to the outside or replaced.

As LTC Steven Richards of ASA(IL&E) remarked, "What's ironic is (that) in Europe there is a program called the Safety and Occupational Health Interface between the two professions because we recognized the tremendous overlap in area of responsibility and expertise."[1]

The case study illustrates a serious deficiency in Army force protection. A plethora of health and force protection programs have emerged over the years in a piecemeal, haphazard fashion in an effort to address new problems, emerging enemy threats, the development of new technology, or by vigorous proponents building empires in times of budgetary plenty without any central administrative control.

Consequently, there now exists a tremendous variety of very sophisticated programs and systems, each approaching problems from its own narrow perspective while ignoring problem aspects which fail to fit the parameters or capability of the program manager. In addition, each advocate does "his own thing", in his own specialized area, and reports through his own "stovepipe" chain of command.

In the case study, the safety evaluation was made by the safety experts in Europe who report through the safety "stovepipe" to the Director of Army Safety. The industrial hygiene evaluation was conducted under the auspices of the U.S. Center

for Health Promotion and Preventive Medicine (USACHPPM), a subordinate unit of the U. S. Army Medical Command (MEDCOM) and reports to the (Army) Surgeon General (TSG). Frequently, there is no lateral communication between the organizations and "the rest of the story" may never surface. Meanwhile, the soldier is at increased risk, only partially benefiting from the vast arsenal of protective knowledge and programs that are available.

2.1 Causes of Attrition Among Military Personnel

Attrition in manpower can potentially destroy an army. The Textbook of Military Medicine, published by the Office of the (Army) Surgeon General states that the important sources of personnel attrition in the combat zone are:

- enemy action, which by definition includes not only battle injuries but also being captured
- disease
- onbattle injuries, which also includes the effect of a hostile environment
- desertion
- administrative action that results in a soldier's being transferred from the unit in question.[4]

Desertion, administrative, and missing in action categories of attrition are irrelevant to the focus of this paper and will not be discussed

2.1.1 Disease and Nonbattle Injury

It is an unfortunate truth that with the exception of the Korean War, in every 20th Century conflict in which United States armed forces have participated, the number of disease and nonbattle injuries (DNBI)[5] has substantially exceeded the number of casualties directly related to enemy action. The Textbook of Military Medicine quoted earlier continues bluntly:

> When viewed from the perspective of military history, disease, and its common companion, a hostile environment, have been far greater threats to soldiers' health than hostile actions of a military enemy...The relative importance of losses due to battle injury and from disease and nonbattle injury is determined by a variety of factors, including:

- the presence of endemic diseases
- the climate and the environment
- the duration of the deployment, and
- the nature of the tactical mission and the intensity of the fighting.[6]

2.1.2 Statistics

A revealing set of statistics from World War II, Korea, and Vietnam from a single source is shown in the table below.[7] The data from Desert Shield/Storm is from a second source. Note the trends that are displayed:

Table 1: Percentage of Army Hospitalizations During Combat Due to Injury and Disease

Conflict %	Battle Injury %	Non-Battle %	Disease %
World War II	4	11	85
Korea	23	18	61
Vietnam	17	14	69
Desert Shield Storm[8]	4	24	72

2.1.3 Conclusions

- Disease is by far the most frequent cause of attrition. There is always a background of illness in any population that is dependent upon age, gender, and activity. However, that factor is greatly compounded by the effects produced by the enemy environment, climactic considerations, unprotected and unhygienic living conditions, and the stress associated with combat.

- Disease frequency ranges from 2.6 times in Korea to 21 times in Desert Storm the prevalence of battle injury in every conflict.

- During the period of almost 50 years between World War II and Operation Desert Storm, despite remarkable advances in modern medicine, the relative proportion of battle injury, nonbattle injury, and disease have remained relatively unchanged.

3. Efforts to Reduce Attrition

The loss of combat power due to attrition has not gone unnoticed by Army leadership. In response, a broad variety of force protection programs have evolved. Army Field Manual (FM) 100-5, Operations, provides an operational focus on force protection with the practical intent to "...conserve the fighting potential of a force so that commanders can apply it at the decisive time and place."[9]

Force protection is viewed as the fourth element of combat power: leadership, maneuver, firepower, and protection. Leaders are expected to integrate the four elements in a variety of combinations appropriate to the situation to produce victory. In addition, the four elements combine to provide a wall of protection around the soldier. The circumstances can be illustrated as shown below.

The element of protection includes four components:

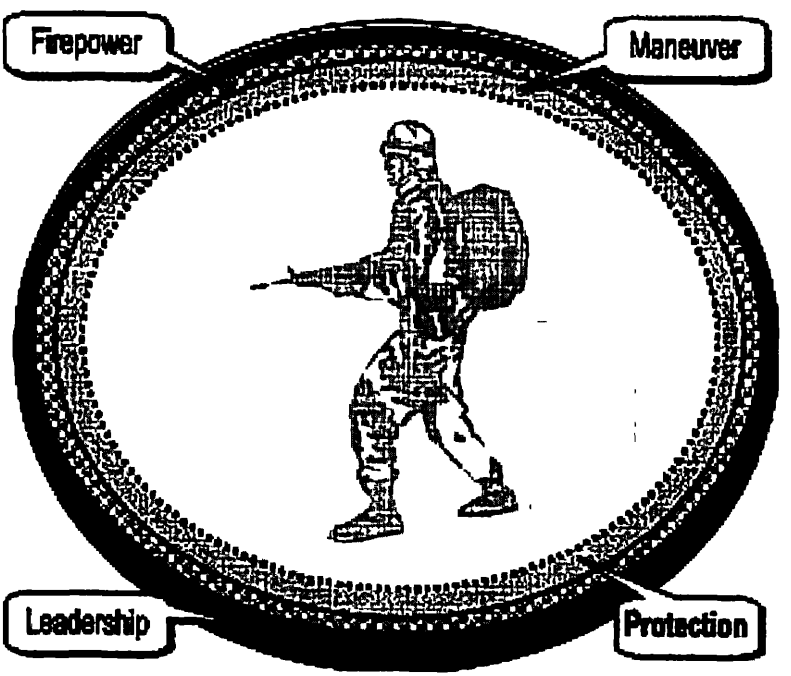

Figure 1: Elements of Force Protection

3.1 The Components of Protection

Protection includes four components.

- **Operations security (OPSEC):** OPSEC is intended to deceive enemy units or prevent enemy units from locating U. S. forces through the use of reconnaissance, dispersion, camouflage and other techniques.

- **Concern for basic needs:** Access to preventive medicine and hospital services, and prevention from prolonged exposure to debilitating conditions such as cold; provision for welfare and morale needs (demonstrated through such amenities as hot meals, showers, and mail services whenever possible); and, speedy and efficient access to repair parts and maintenance facilities to ensure that weapons systems and vehicles are operational.

- **Safety:** Safety is emphasized during all planning, training, and operations. Commanders make extraordinary efforts to instill safety considerations into everything that soldiers do. Concern for safety embraces the concept that leaders care about their soldiers and, the demonstration of concern is readily affirmed by soldiers.

- **Avoidance of fratricide:** The unintentional killing or wounding of friendly personnel by fire requires strong command, disciplined operations, detailed situational awareness, and anticipation of operations when conditions raise the probabilities of fratricide.[10]

3.2 Current Organization for Force Protection

Commanders at all levels are primarily responsible for providing protection for forces under their command. Intelligence and Operations are major functional staff areas at all

levels of organization. This aspect of force protection will not be further addressed in this paper. Suffice it to say, OPSEC is well integrated into all aspects of operations through the formal operations plan (OPLAN)

Outside the Intelligence and Operations communities and the direct purview of combatant Commanders, there are three major programs concerned with force protection services and three Army schools with a major focus on force protection. The three programs are: the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), the Army Safety Program, and the Army Environmental Program. The three Army schools are the Army Medical Department Center and School (AMEDDC&S), the U. S. Army Engineer School (USAES), and the U. S. Army Chemical Center and School (USACMLS). These are shown in Figure 2.

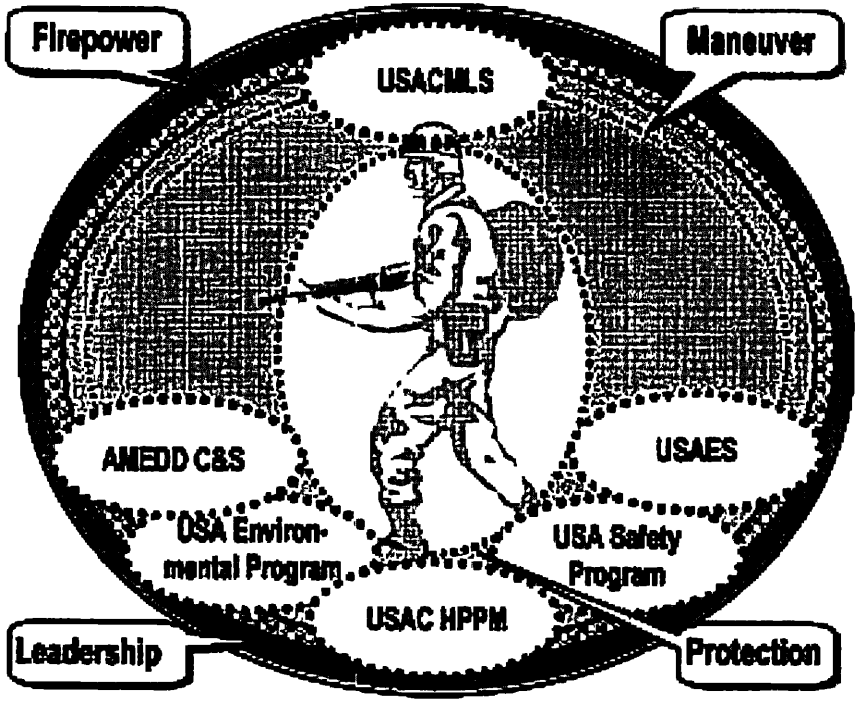

Figure 2: Schools, Programs, and Force Protection

3.2.1 Army Medical Department (AMEDD) and Center and School

The Army Medical Department provides services with a phased health care system, beginning with the combat medic at the point of injury and extending through a variety of evacuation systems to hospital and medical care facilities back in the United States.[11]

In 1994, the AMEDD re-engineered the old Army Environmental Hygiene Agency (AEHA) into the U. S. Army Center for Health Promotion and Preventive Medicine in keeping with a renewed focus on environmental and preventive medicine. While the aid stations and field hospitals address the acute medical care needs of soldiers, preventive medicine resources under the guidance USACHPPM, focus on the myriad of situational, environmental, and hygiene associated concerns that can transform a soldier into a DNBI statistic.

Occupational health, industrial hygiene, entomology, ergonomics, health promotion, infectious disease, and behavioral health are but a few of the medical programs that contribute to force protection.[12] In addition, the AMEDD Center and School is also deeply involved with the professional training and career management of soldiers in environmental and medical Military Occupation Specialties (MOS).

3.2.2 The Army Safety Program (ASP)

The second major program impacting force protection is the Army Safety Program. It is chartered to analyze the potential for and the prevention of accidents which are defined as "An unplanned event or series of events that results in injury/illness to ...Army...personnel and/or damage to...property."[13] In addition to basic safety, the Army Safety Program addresses tactical survivability, industrial hygiene,[14] environmental protection, occupational health,[15] and fratricide prevention.[16]

It makes very rational sense to include industrial hygiene and occupational health as a part of a safety program. The reverse, to include safety as a part of industrial hygiene and occupational health, makes equally good sense. However, the proponent for both the latter programs is the Surgeon General through the Commander USACHPPM. In the case study that opened this discussion, the problem arose due to the fact that even though there were major overlaps in the disciplines concerned, there was no plan for adequate cross communication between them. The seam between the two programs became the crack through which the problem fell.

A Functional Area Assessment (FAA) conducted by the Army Safety Center in October 1995 recognized the fragmentation, lack of ownership, and lack of a clear definition for force protection activities. The report reads, "As we integrate risk management into the Army's processes, safety is only a portion of the entire force protection pie. A central question is to determine if an integrated force protection program and organization would be effective and prudent for Army consideration, and if so, where should the proponency for the integrated program lie."[17]

In another section, the report discusses the feasibility of "...integrating safety functions with other relevant functions into a Force Protection Office, at all levels of the Army structure."[18]

3.2.3 The Army Environmental Program

The third program with a major interest in force protection is the Army Environmental Program. The Army environmental ethic percolates through Training and Doctrine Command (TRADOC) and the U. S. Army Corps of Engineers all the way to the soldier in the foxhole. In Army Environmental Strategy XXI (draft), the concept of "Concern for the environment is integral to all Army training activities. Force protection is also a key component."[19]

The Army is resolute in its determination to instill the philosophy "train as you fight" into every soldier. Conservation of the environment has become a military necessity to comply with the will of the American people and to ensure the judicious use of training areas so that the land will be continually available for use. In addition to the conservation philosophy, the corollary "fight as you train" prompts the realization that the techniques learned during training to ensure the continued health of land must also be incorporated into combat scenarios. Whenever possible, even during combat, good environmental practices while managing hazardous materials (HAZMATS), refuse disposal, conservation, and the preservation of clean soil, water, and air become strong force protection techniques. Such practices assist in maintaining a relatively healthy natural to support the soldier in the midst of the hostile environment of war.

Once again, however, examination of the "Environmental Trace,"[20] reveals no command and control connections with either the preventive medicine community or the safety community. Each program reports through its own "stovepipe" to three different members of the ARSTAF who have no formal responsibilities for force protection coordination.

3.3 Current Training Opportunities

The preceding paragraphs have discussed the involvement of three major programs (preventive medicine, safety, and environment) in force protection. In addition, the formal military schools at the AMEDDC&S and through TRADOC assist the three programs in the educational arena by incorporating the concepts of environment, safety, and good health practices into the Programs of Instruction (POI) at each of the service schools.

3.3.1 Army Medical Department and Center and School (AMEDDC&S)

The AMEDDC&S provides training and education for the enlisted Military Occupation Specialties (MOS) and officer Areas of Concentration (AOC) for all AMEDD personnel ranging from the medic through the technical and professional services available through USACHPPM. The AMEDD also incorporates Common Task Training (CTT), including force protection activities, as an integral part of the training of all AMEDD soldiers. This training begins during Initial Entry "Basic" Training (IET) and is reinforced during each of the subsequent courses provided by the Center. In short, the AMEDDC&S provides all the branch-specific force protection training received by AMEDD enlisted and officer personnel.

TRADOC provides similar training for all soldiers outside the AMEDD. The combat arms (infantry, armor, artillery, and combat engineers) schools will obviously focus much more attention on the firepower and maneuver elements of combat power in addition to protection. But, the TRADOC service schools are the source of training in protection for all non-AMEDD soldiers.

3.3.2 U.S. Army Engineer Center (USAEC)

Engineers have historically been assigned a large role in force protection, dating back to colonial days. That role derives from efforts to protect the soldier from the enemy by building fortifications and later in assisting soldiers in surviving in the "hostile" natural environment.

Modern engineer operations "...include construction, real property maintenance,...topographic support, and combat engineering (mobility, countermobility, survivability, and general engineering) within the theater of operations."[21] Engineer operations are designed to improve the mobility of American forces, impede the mobility of enemy forces (countermobility), and enhance the survivability by providing

protection through the construction of fighting positions, fortifications, tanks traps, etc., of American forces. In addition, through the U.S. Army Corps of Engineers, there has always been a major focus on environmental concerns.

In 1995, TRADOC assigned the U.S. Army Engineer School (USAES) responsibility to function as executive agent for the development and integration of environmental doctrine and training.[22] Through the USAES, TRADOC has disseminated doctrine and training for all environmental and protection concerns through all the Army service schools.

3.3.3 U. S. Army Chemical School (USACMLS)

The Army Chemical School has been actively involved with "...Security Assistance in (Nuclear, Biologic, Chemical) NBC Defense, Treaty Verification, chemical weapons demilitarization, and environmental management and support."[23]

Several factors make the Chemical Corps an important advocate of force protection practices. First, force protection is a major duty and responsibility of all Chemical Corps personnel. The training is constantly instilled into all chemical soldiers from the highest staff levels to the foxhole. One important aspect is the expectation that the soldier will be an active trainer of force protection skills for both groups and individuals. Chemical defense skills must be mastered to ensure survival in a contaminated environment. Failure to know and apply the skills is almost certainly guaranteed to generate a casualty.

Second, to effect the "blanket" coverage of every soldier in every organization, Chemical Corps staff officers are assigned at every level of command, and non-commissioned officers are assigned to individual units all the way down to the company level. Except for supply personnel, no other functional area is represented in such a seamless fashion all the way to the company level. The Chemical Corps is the only organization designed to carry a single message of force protection all the way from the headquarters to the foxhole.

Third, because of the nature of NBC warfare, chemical soldiers are trained to deal with environmental contaminants, HAZMATs, chemically contaminated areas, etc. as a part of their daily lifestyle. The same techniques that are used for the management of chemical agents are applicable to the management and handling of other contaminants in the environment. Protective skills, decontamination and clean up after a HAZMAT spill are just another opportunity to practice the skills that provide protection from exposure to a chemical warfare agent.

Finally, the art and science involved with the employment of chemical weapons and obscurants (smoke) is largely predicated on favorable environmental (atmospheric conditions, temperature, humidity, wind, topography, natural features, etc.) conditions. Consequently, there is a very broadly-based awareness of environmental factors, and, the implications of those factors for force protection, in the training of every chemical soldier.

Unfortunately, despite the fact that the chemical soldier is engrossed with force protection and environmental concerns virtually 100 percent of the time, there is no formal relationship with other Army organizations with similar interests. There is no formal relationship between the Chemical School/Chemical Corps and the U.S. Army Corps of Engineers/U.S. Engineer School, or with the Army Medical Department/AMEDD Center and School. This dictates a comprehensive focus on force protection even though all the organizations concerned are actively involved in various aspects of force protection programs. This set of circumstances suggests the potential for significant inefficiencies and oversights in the programs.

3.4 Fragmentation in Environmental Health

The Army has made immense investments in force protection and environmental programs which should theoretically complement each other. However, the programs all exist as separate entities and lack the comprehensive focus required

of an Army-wide program. The discussion that follows illustrates the compartmentalization among two of the components of force protection, environment, and health.

As part of a contract with the Army Medical Research and Materiel Command, the Uniformed Services University of the Health Sciences (USUHS) recently compiled a report entitled *Assessment of the Health Role in Environmental Programs*.[24] The study goal was to "...clearly define the health mission in environmental programs and to help develop effective policy options and management strategies.... Study results should be valuable in helping produce successful programs for protecting human health, the soldier, and the environment."[25] The study did not specifically address "force protection" as a whole. Rather it focused only on the medical/ environmental interface, where the goal of environmental health was to prevent harm to, and enhance the quality of human health and the environment.[26,27]

Using a literature review and expert working groups, an evaluation of preventive medicine, and environmental health programs and organizations was completed to examine the interface between the disciplines as depicted in Figure 3.

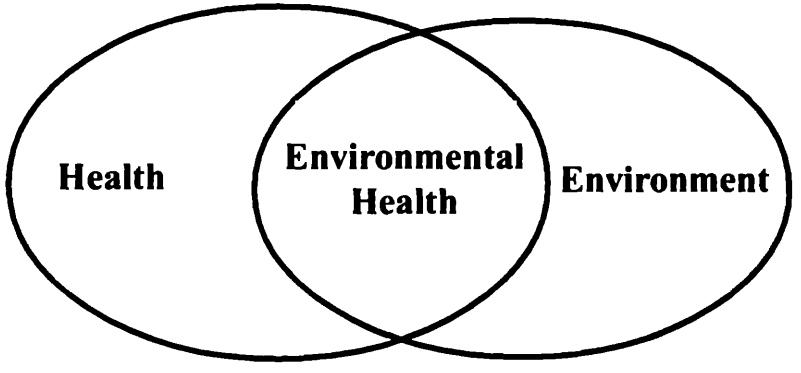

Figure 3: Program Integration

3.5 Lack of Program Integration

The USUHS paper describes how environmental health programs are "diverse and found at many organizational levels throughout the Army. However, with the exception of the field (units)[28], most environmental health programs are within the MEDCOM."[29] Hence they have no formal requirement of lateral sharing of information with other organizations involved in the force prevention effort. The report continues:

> *The need and authority to have full cooperation between environmental programs and environmental health programs, as currently structured in the U.S Army, is established in both medical and environmental regulations. There are situations throughout the Army where, because there is active interaction between the environmental and environmental health communities, resulting environmental actions protect human health and the natural environment by technologically and fiscally efficient means [30] However, such interaction and cooperation between the two communities does not permeate the Army organizational structure It is variable, often limited, and in some cases does not exist. Thus environmental efforts may be undertaken without health/medical input which can lead to environmental decisions and actions that are· not health-based, may be technologically and economically excessive, or may not eliminate or mitigate a health threat to an acceptable level Environmental personnel are not always aware of environmental health functions ...The underlying root problem is that, in practice, health considerations are not an integral part of environmental programs because both are perceived as separate and distinct from each other and are not represented equally at various organizational levels throughout the Army* [31]

Finally, an exhaustive Appendix E of the paper lists no less than 114 Army and related organizations having some environmental /environmental health mission or program.[32] Many of the listed organizations are analogous organizations at varying levels of the chain of command. However, there is an astounding variety of separate organizations and programs, many with identifying acronyms, which are focused on some small aspect of the environment/health picture.

3.6 Conclusion

Granted, no legitimate argument can be won by analogy. However, the wide variety of organizations and programs with closely aligned or parallel missions and structures indicates that since there appears to be so much compartmentalization in the environmental /environmental health arena, similar parallel programs and structure exist among all of the elements involved in force protection.

> *While the military leadership has tolerated this degree of fragmentation in the force protection with a myriad of separate programs each controlled by the major proponents listed previously, the civilian Army Secretariat has consolidated these activities under a single proponent. The Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health) is the sole individual responsible for the three elements described by the title and hence has responsibility for at least two of the three major programs that contribute to force protection. The only aspect of force protection that is not represented is the medical aspect.*[32]

The quotation from Major General Scales that introduced this paper is relevant to the force protection agenda. Both the civilian and military leadership of the Army are in

philosophical "convergence" on the need to eliminate "seams" in army activities and programs. The quotations that follow address the concept of force protection using a variety of terms and phrases. Regardless of the specific terminology, it is easy to confirm the philosophic intention with unusual clarity.

3.6.1 Annual Report to President, Congress (Environmental Security Program)

In *The Annual Report to the President and the Congress*, presented by the Secretary of Defense William S. Cohen in April 1997, emphasized, "A strong environment, safety, and occupational health (environmental security) program is an integral component of a strong defense. The...environmental security program ... protects U.S. troops and their families, manages training and living areas carefully, acts as a good citizen and neighbor, and sets a good example to other militaries around the world."[33]

3.6.2 Joint Vision 2010 – Full Dimensional Protection

Joint Vision 2010, in consonance with Secretary Cohen's vision, describes how four Emerging Operational Concepts will contribute to full spectrum dominance against any enemy challenge. Those four Emerging Operational Concepts are Dominant Maneuver[34], Precision Engagement[35], Focused Logistics[36], and Full Dimensional Protection[37].

Full Dimensional Protection is subsequently defined as "...control of the battlespace to ensure our forces can maintain freedom of action during deployment, maneuver, and engagement, while providing multi-layered defenses for our forces and facilities at all levels.[38] Further, "Full Dimensional Protection will be built upon information superiority which will provide multidimensional awareness and assessment...to provide a more seamless joint architecture for force protection...."[39]

3.6.3 Army Vision 2010 – Protect the Force

Army Vision 2010, in turn, describes the Army's plan for achieving the Full Spectrum Dominance described in the Joint Vision. Army Vision 2010 employs six patterns of operation:[40] "Project the Force"[41], "Decisive Operations"[42], "Shape the Battlespace"[43], "Sustain the Force"[44], and "Protect the Force."[45]

The concerns addressed in protecting the force refer directly back to Joint Vision 2010 and the operational concept of "Full Dimensional Protection." "The Army's approach will be a holistic one, applying organization, materiel, and procedural solutions to the challenge of protecting soldiers, information and equipment across the full spectrum of the operating environment."[46]

In an effort to simplify the concepts and circumvent the jargon:

SINCE: *The Annual Report to the President and the Congress* defines Environmental Security in terms of the disciplines comprising force protection with the expressed purpose of protecting soldiers; and,

IF: *Joint Vision 2010* declares force protection as an "emerging operational concept"; and

IF: *Army Vision 2010* declares force protection as an "operational pattern"; and,

IF: both visions are derived from *The Annual Report to the President and the Congress*, with the aim of protecting soldiers; and,

IF: by the DOD definition, "Environmental Security is comprised of restoration, compliance, conservation, pollution prevention, safety, occupational health, explosives safety, fire and emergency services, pest management, environmental

security technology, and international activities..."[47] (in other words all the disciplines that comprise force protection);

THEN: Environmental Security is an extension of the concept of force protection with the extension being the addition of the environmental considerations which are already independently directed by Army Regulation 200-1, Environmental Protection and Enhancement, when it states:

> *The Army is committed to environmental stewardship in all actions as an integral part of the Army mission."*[48] *"The Deputy Chief of Staff for Operations and Plans (DCSOPS) will—establish mission-related policies and procedures to support environmental stewardship in all mission, contingency, training, and mobilization plans and operations* [49]

The only component of force protection that is absent from the definition of Environmental Security is preventive medicine. Therefore, to develop a seamless program of Environmental Security, a way must be found to incorporate a preventive medicine capability (the services provided by USACHPPM) into the Environmental Security arena.

Therefore, three conclusions can be drawn.

- Beginning with DOD and extending through the Joint Staff and the Army Staff, it has been possible to trace a thread of intent to develop a seamless, integrated, full-spectrum program known as Environmental Security that protects soldiers from the environment and concurrently protects the environment from the soldiers.

- A similar thread is woven through doctrine and training materials where the Environmental Security concept described above is referred to a Force Protection.

- Since there is agreement between DOD policy and Army policy; and, since there is philosophic agreement to eliminate the "seams" between programs, then, it should be possible to capitalize on the opportunity to develop a seamless, integrated, full dimensional force protection effort under the logo of Environmental Security. The remainder of this paper will be devoted to proposing a method for implementing the Environmental Security program.

4. Implementing an Environmental Security Program That Works

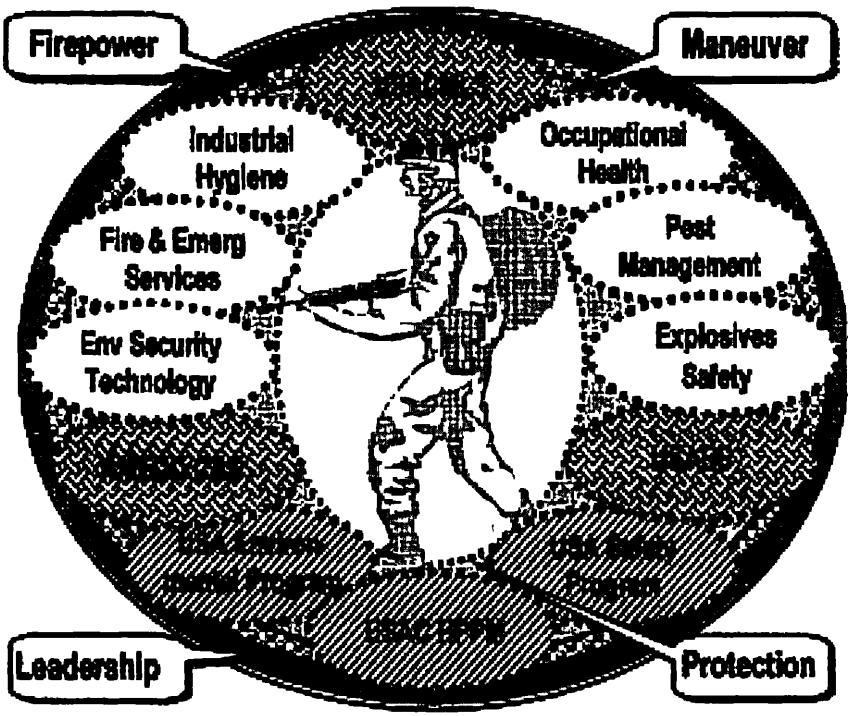

Figure 4: Notional Concept of Environmental Security

Figure 4 builds on the diagrams that appear in earlier sections of this paper. Once again, the four elements of combat power (leadership, maneuver, firepower, and protection) are depicted by the elliptical rings surrounding the figure. The dotted line on the inner aspect of the ellipse of Protection signifies that the boundary must be permeable to allow an information exchange.

Similarly, the dotted rings surrounding the schools (shown with the weave pattern) and the major force protection programs (shown with the light up-slanting diagonal hatching) that were discussed earlier, overlap with each other and are encircled by the dotted line to indicate the opportunity for information exchange in and out of the various disciplines.

The additional ellipses added to this figure indicate the remaining functions, which are included in the DOD definition

of Environmental Security. Again, the dotted lines surrounding the ellipses indicate the opportunity for information flow among all the constituents, and, also show that each of the disciplines may contribute useful information to any of the elements of combat.

Central to the entire concept is the soldier, enveloped in a sea of Environmental Security, as if in a cocoon.[50] This organizational structure capitalizes on the strengths of each of the individual components and benefits from the force multiplying effect of the whole. The soldier is the beneficiary falling heir to a relatively secure, risk controlled environment which provides a haven of protection of all types despite the surrounding threats.

Using the notional diagram as a guide, the following implementation plan suggests one way to make the concept of Environmental Security a program of seamless force protection.

4.1 An Environmental Security Implementation Plan

In 1992, the Army Environmental Policy Institute (AEPI) published *the U.S. Army Environmental Strategy into the 21st Century*[51] (hereafter called simply the Strategy). Although the focus of the Strategy was primarily directed at preserving natural resources, it requires only slight modification to transition into a strategy that places the focus on Environmental Security. Therefore, a reevaluation of the original plan from a slightly different perspective can serve as an implementing plan for weaving Environmental Security into Army operations and protecting both the soldiers from the environment and the environment from soldiers.

The Strategy describes six critical elements for success. Only the first four of these critical elements will be addressed as the remaining two elements (Prioritize Army Resources and Harness Market Resources) are outside the scope of this paper. By inserting the single word "Security" in the third element, the elements apply equally well to the concepts of environment and Environmental Security.

- Commit the Chain of Command
- Organize for Success
- Spread the Environmental *(Security)* Ethic
- Train and Educate the Force

These four elements will be discussed in detail below.

4.2 Commit the Chain of Command

Obtaining commitment from the chain of command is the first critical element for success, and may likely be the most difficult aspect of implementing the Environmental Security program. Commitment to new ideas does not come easily. As B. H. Liddell Hart has said, "The only thing harder than getting a new idea into the military mind, is getting an old one out." Thus, a concerted effort must be made to market the new idea of Environmental Security and contrast it with force protection if Environmental Security is going to be successfully promoted.

Fortunately, there exists a current climate of national, social, and military concern that may provide a launching platform for the concept. As mentioned earlier, the SECDEF Report to the President and the Congress advocates an Environmental Security program, the national conscience is more aware than ever before about the environmental impacts of nations, force protection is a major component of Joint and Army policy documents, and, a variety of Army schools and programs are deeply involved in environmental and force protection programs.

Therefore, it would appear that a considerable effort has already been launched to educate the chain of command to the importance of Environmental Security. Thus the first critical element for success has at least been thoroughly and widely addressed. Whether or not true commitment has occurred will only be determined after the passage of time when there will be opportunities to analyze the efforts of leaders at all levels to work cooperatively at implementing Environmental Security.

4.3 Organize for Success

The second critical element for success is to organize for success. Referring back to the earlier figures, an argument can be advanced that any of the major schools and programs that are represented (safety, environment, AMEDDC&S, USAES, USCMLS) could theoretically serve as the advocate for an Environmental Security program. Unfortunately, to date there has not been a very convincing effort at cooperation among the various parties. However, the lack of centralized command and control must certainly bear a major portion of the culpability for this shortcoming.

4.3.1 General Officer Representation

Environmental Security can only become reality if there is a strong line of coordinated leadership and proponency from the highest DOD and Army levels to the bottom of the organization. The proponent must be not only visible and credible, but, also, an almost zealous advocate of Environmental Security.

Practically speaking, the advocate must also have a level of military rank at least equal to that of his peers to insure his credibility within the Army and recognition from agencies outside DOD. The equivalent rank structure is particularly critical when contentious debates involving planning, programming, budgeting, and execution decisions are made.

4.3.2 Director of Army Safety

When the leadership and structure of the component parts of Environmental Security are examined, several enlightening findings are made. First, the Director of Army Safety is a Brigadier General "dual-hatted" as the Commander of the Army Safety Center. He is rated by the Director of the Army Staff, and senior rated by the CSA. By virtue of his position

and rating scheme, and because he is a full member of the Army Staff, the Safety Program enjoys both very high priority and very high visibility in the Army Staff. The Safety Center, in addition to general and aviation safety, also monitors explosive safety, and installation fire and emergency services. Tactical Survivability and Fratricide Prevention are items of particular research interest.[52] A better example of linked authority and responsibility is difficult to find.

4.3.3 Commander, USACHPPM

Likewise, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) is commanded by a Brigadier General. USACHPPM is the axis around which all Army Preventive Medicine activities revolve.[53] The Commander of USACHPPM is rated by the Surgeon General, and senior rated by the Director of the Army Staff. Once again there is an outstanding level of authority commensurate with the high level of responsibility.

4.3.4 Director, Army Environmental Program

The Army Environmental community has not fared as well with General Officer representation. Originally the Army Environmental Office was a Corps of Engineers asset. The Director of Environment reported to the Assistant Chief of Engineers (ACE) and there was no Department of Army (DA) level integrated environmental organization, Rather, the various programs functioned haphazardly through a diverse mix of environmental agencies and offices who supported the field and the Army Staff (ARSTAF).[54]

4.3.5 Livingstone Plan

In 1992, Susan Livingstone, then Assistant Secretary of the Army (Installations, Logistics, and Environment), effected

a redesign of the environmental organization. The Livingstone plan produced a radical realignment of environmental assets and responsibilities by removing all environmental programs from the command and control of the Army Corps of Engineers and placing them under the purview of an Assistant Chief of Staff (Installation Management). Simultaneously, Livingstone directed that a General Officer billet be added "...to function as ARSTAF head of the Army Environmental Office and as Commander of the Army Environmental Center (AEC)."[55]

4.3.6 First Army DEP

By 30 November 1992, Brigadier General Jed Brown was assigned as the first Director of the Environment and provided the program with an outstanding advocate. Unfortunately, when BG Brown retired from active duty in 1994, he was never replaced. The billet is now occupied by an O-6, who, for all the reasons cited earlier, does not command the comparable degree of respect and regard that exists among his program level peers and are all General Officers.[56]

Furthermore, to add insult to injury, not only has the General Officer position been downgraded, the Office of Director of Environmental Programs (ODEP) has recently been downgraded from a Directorate to a Division under the Assistant Chief of Staff – Installation Management (ACS(IM). Consequently, Army environmental programs end up deriving their only significant advocacy from the ACS(IM) whose primary interest is out of necessity installations. Furthermore, the ACS(IM) is inescapably embroiled in a conflict of interest between environmental and installation obligations that dilutes or eliminates his ability to support in an unbiased fashion the direct mission aspects of environmental programs in competition with installation requirements.

Therefore, in order to reestablish parity among peers, the General Officer, Director of Environmental Programs (DEP), must be reinstated. The Office of the Director (ODEP)

would then become the source of all direction in environmental matters. The DEP should also be "dual-hatted" as the Commander, Army Environmental Center (AEC).

4.3.7 Deputy Chief of Staff – Environmental Security

While it was in place, the designation of the O-7 position for environment completed a triumvirate of General Officers (USACHPPM, Safety, and Environment) who could collectively represent virtually every facet of Environmental Security. However, each of the three general officers continued to work almost exclusively along the lines of his technical expertise (and within his technical rating chain) with little integration of ideas and programs. A potential solution utilizing the present organizational structure would place the Director of the Army Staff (DAS) in charge as the single Environmental Security "boss". However, the DAS is already occupied with more than enough program management. Therefore, this alternative does not seem to be the best solution. Until there is a single "boss" to command respect, demand compliance with orders, and run interference between the technical chains of command, true integration of the Environmental Security concept can not occur. Therefore, the most effective alternative would be to create a new position, Deputy Chief of Staff - Environmental Security (DCS-ES).

4.3.8 Selection of the DCS-ES

The choice of a Deputy Chief of Staff-Environmental Security offers an innovative selection opportunity. The selection Board could simply review the records of the three Brigadiers occupying the top positions in USACHPPM, ODEP, and Safety. The choice could then be made by:

- Choosing the "best qualified" which would theoretically provide the best leader and the most productive outcomes, or

- Rotating the position, in turn, among the three Brigadiers. This alternative would have the advantage of ensuring that the perspective of the organization would not be skewed by a succession of "best qualified" officers who by chance came from the same background.

Alternatively, because of the way in which the components of Environmental Security have already been woven into the fabric of Army policy and doctrine, a variety of individuals in a variety of branches could be capable, qualified, and deserving of consideration, i.e. branch immaterial. The selection criteria should discern individuals with incomparable leadership skills, and, the ability to forge an Environmental Security program from a collection of disparate, and competitive parts.

A bonus effect of the latter alternative would be the potential for relatively unlikely ARSTAF General Officer candidates to ascend from career fields, particularly among the combat service and combat service support branches which have relatively few opportunities for advancement to general officer. Whichever alternative is chosen, the rating schemes should avoid undue branch influence by going directly through the Director of the Army Staff to the Vice Chief. Appraisals from the technical supervisors could be provided as intermediate raters or through Letters of Input.

4.3.9 Organization for Environmental Security

The Deputy Chief of Staff-Environmental Security (DCS-ES) would provide the unified direction for the environmental, safety, and preventive medicine programs in the Army. The Deputy Chief of Staff-Environmental Security would also become simultaneously the raters of the Director, Environmental Programs; the Commander, USACHPPM; and, Director of Army Safety as shown in Figure 5. This arrangement would ensure the ability of the center directors to focus on the same problems that were considered top priority by the ARSTAF.

The arrangement would also preclude undue interference from the technical chains of command from which the directors had departed.

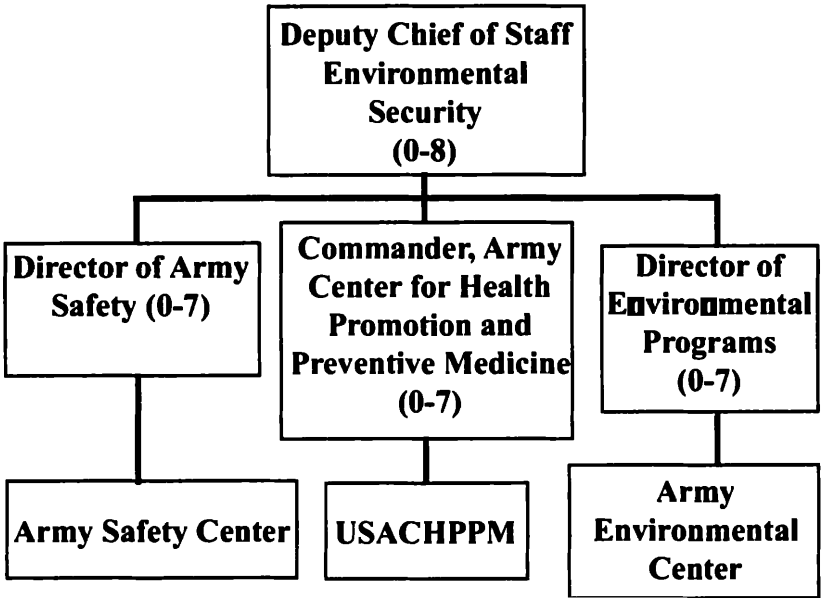

Figure 5: Office of Deputy Chief of Staff-Environmental Security

This organizational solution would have a number of benefits. It would:

- provide the coordination, guidance, and direction necessary to make Environmental Security a reality among the ARSTAF and throughout all the functional staff elements.

- ensure that qualified and knowledgeable individuals made up the list for eligible candidates.

- provide the Chief of Staff, Army with a credible, competent general staff member who would be the

single Army "conscience" for all matters of Environmental Security.

- the DCS-ES would be a peer of the other DCSs so that he would be well known and in an appropriate position to be a powerful advocate for Environmental Security matters

- provide daily interface among the Deputy Chiefs of Staff for Personnel, Intelligence, Operations and Plans would cement coordination with the other facets of Environmental Security.

Simultaneously, the DCS-ES would obtain information critical to his understanding of the rationale for any constraints imposed on the Environmental Security program from other legitimate staff concerns. Full integration of Environmental Security would occur when "legitimate staff actions" are willingly subjected to risk management scrutiny at the highest levels before critical judgments are made in all areas of Army management and execution.

Again, this proposed course of action is similar to one of the alternatives considered by the Safety FAA cited previously.

> *An alternative, reengineered organization would be to integrate safety function with other relevant functions into a Force Protection Office,at all levels of the Army structure ...Full consideration and development of this option would be appropriate through an integrated Force Protection FAA...This option would also provide a coherent information (base) to commanders as an integrated unit enhancing his ability to make timely decisions.*[57]

4.3.10 Training Army School Proponent

In addition to designating an appropriate leadership structure, a single proponent and school location should be established to serve as the focal point for all aspects of Environmental Security. Three alternatives immediately come to mind (presuming the designated locations have adequate capacity and facilities to accommodate the program).

4.3.11 U.S. Army Engineer School (USAES)

The U.S. Army Engineer School at Fort Leonard Wood, MO has been designated by TRADOC as the Army Executive Agent for the development and integration of environmental doctrine and training. Since much of that planning is underway and closely followed by implementation through the USAES, proponency by that organization for Environmental Security could be considered. Until recently the Engineer perspective has focused primarily on the effects of the environment on the soldier.

More recently, since becoming the Executive Agent for Environmental Training and Doctrine, the USAES has expanded its scope to include the effects of the soldier on the environment. The Engineer School has developed training support packages, circulars, correspondence courses, and notes that are inserted in numerous schools lesson plans.[58]

4.3.12 U.S. Army Chemical Center and School

The U.S. Army Chemical Center and School, as a consequence of a Base Realignment and Closure (BRAC) decision, is being moved to Fort Leonard Wood, MO. This move could have a bonus effect. The Chemical School has long included environmental concerns, safety, force protection, environmental effects, etc. in its curricula as a portion of the

science of employing chemical weapons. Even more importantly, the Chemical Corps has significant personnel structure already built into TO&E organizations which provides combat links from the headquarters elements at all echelons all the way down to the Company level through the Chemical Non-Commissioned Officers. Capitalizing on the augmented educational and training abilities of the two schools in one location, coupled with the potential to utilize chemical personnel as advocates for Environmental Security, could provide a visible advocate and force multiplier.

4.3.13 U.S. Army Safety Center

Second, the U. S. Army Safety Center could serve as the proponent and the U. S. Army Aviation Center the school location. The breadth of the Safety mission, and, the large collection of experts at the Safety Center coupled with the Aeromedical Research Laboratory at Fort Rucker, AL could provide a beneficial confluence of ideas. Fort Rucker is an inexpensive location and far enough away from the Washington to allow it to operate relatively unencumbered by "beltway politics." However, there is relatively little representation currently available from the environmental and medical communities.

4.3.14 Army Medical Department and Center & School With USACHPPM

Third, the proponent could be through The Surgeon General, the AMEDD Center and School, to the Commander, USACHPPM. With TSG located in Washington, DC and USACHPPM at Aberdeen Proving Ground less than two hours away, the potential for outstanding cooperation, publicity and high visibility may be considered major benefits in launching an innovative model program like Environmental Security.

USACHPPM also has a well-established reputation and a sophisticated set of facilities at Aberdeen Proving Ground (APG). Already in place are a number of programs in Occupational Medicine, Environmental Medicine, a Directorate of Environmental Health Engineering with programs in Air Pollution Source, Ambient Air Quality, Environmental Health Risk Assessment, Noise, Water, Waste, Deployment Environmental Exposure Surveillance, etc.

4.3.15 U.S. Army Environmental Center and USACHPPM

Fourth, the proponent could be through the Office of the Director of Environmental Programs and the Army Environmental Center (AEC). AEC, located at APG, has been at the cutting edge of planning and policy for the Army Environmental Program. To take on the challenge of developing a program in Environmental Security would be a tremendous opportunity to consolidate many disparate individual programs into a single entity that would provide a true soldier service and enhance the growing status of the entire Army environmental effort.

Another benefit could derive from the co-location with USACHPPM. The USUHS report cited earlier applauded "the Army Environmental Center (AEC)...(as) an example of a situation where currently there is consistent and programmatic integration of health considerations into several environmental programs....Working together (with USACHPPM) in addressing the environmental and environmental health issues, the two organizations strive to protect the health of soldiers and the Army communities, and enhance environmental protection while enhancing the Army's readiness, modernization efforts, and quality of life."[59] Similar to the Chemical School and the Engineer School being located side by side at Fort Leonard Wood, MO, AEC and USACHPPM would be able to consolidate and share facilities at APG which could prove to be an unexpected bounty.

Obviously, all the school and training alternatives discussed above would require a strict financial assessment to determine the site that would provide the greatest return on investment at an affordable cost. Whichever alternative is selected, the exact force structure and organization of the Environmental Security program should be determined by the selected DCS-ES after the position has been created.

4.3.16 Joint Service Opportunities

There is one further option to consider. Environmental Security is a concern of all U.S. armed forces. The components of Environmental Security (safety, environment, preventive medicine, occupational health, pest management, etc.) affect all the services. Since virtually all operations are now joint, it makes little sense to duplicate efforts among the services. Although each service may have some peculiar needs, the vast majority of ES concerns should be very similar. Environmental Security could be a common ground on which to build a true Joint venture.

Further, since the Assistant Secretary of Defense-Health Affairs (ASD-HA), and the Under Secretary of Defense-Personnel and Readiness (USD-PR) have already taken the lead in some Environmental Security concerns through a recent Department of Defense Directive (DODD 6490.2)[60] and Department of Defense Instruction (DODI 6490.2)[61], both related to Joint Medical Surveillance, those offices could serve as the coordinating authority for additional quantum leaps in inter-service cooperation. For example, USACHPPM is already the proponent for some tri-service programs (Vision Conservation and Readiness Program, Defense Environmental Exposure Surveillance). Utilizing the Joint Environmental Security alternative with consolidated ASD-HA authority has the greatest potential for resource and budget savings while eliminating duplicate and redundant organizational entities. On the down side, it would obviously remove the programs entirely from Army oversight.

4.4 Spread (Market) the Environmental Security Ethic

After obtaining the commitment of top leaders to develop the concept of Environmental Security, and, after confirming that commitment by placing qualified and capable leadership in charge of the program at the General Officer level, spreading (marketing) the concept of Environmental Security is the third critical element for success.

4.4.1 Four Ps of Marketing

The study of marketing has traditionally relied on the "Four Ps": [62]

- Product (selection and development)
- Price (determination)
- Place (selection and design of distribution channels)
- Promotion (all aspects of generating or enhancing demand, including advertising)

The Four Ps provide a simple framework on which to build a plan to spread the environmental ethic.

4.4.2 Product

Nothing is more important to a marketing scheme than defining and producing a superior product. In current market language, Environmental Security would be an "augmented product" which is "an expected product that has been enhanced by a set of benefits that consumers do not expect or that exceed their expectations."[63] The incorporation of all the DOD components of Environmental Security into a single coordinated program would greatly simplify the management and coordination of the program and facilitate a much clearer understanding of Environmental Security.

Environmental Security would be an optimal package for a marketing concept as it integrates a nebulous array of

force protection components into one program that is simple to envision. Environmental Security would also be a marketable concept because it has a high degree of appeal due to its focus on the soldier, and, his safekeeping. And, in the larger sense, Environmental Security benefits all Americans by serving as a protective program for the nation and the world.

4.4.3 Price

It is impossible to estimate the cost, or to place a price tag on the assortment of organizations, agencies, and programs that are currently involved in portions of Environmental Security. However, just by estimating the degree of involvement suggested by the more than 100 organizations and programs involved in environmental/environmental health issues cited earlier, it would appear to be a staggering amount.[64]

The consolidation of all the organizations, agencies, and programs under a single umbrella of control would almost certainly uncover mountains of duplication and redundancy. Elimination of the duplications and redundant programs would appear to more than pay for the effort, particularly if the consolidation is executed as a "no growth" proposal. No increases in costs would be expected because the Environmental Security concept does not expand resource requirements from the current allocations. It simply takes existing programs and personnel, binds them together as parts of an organized whole, and provides them with a singular purpose and direction. However, as noted several times previously, risk management analysis based on available funding and the best return on investment would be conducted to provide the final budget estimates and impacts.

4.4.4 Place (Distribution)

During World War II, one American unit wore a shoulder patch emblazoned with the logo "AAA-0" which stood for Anything, Anytime, Anywhere - Bar Nothing! Similarly, the place and locale for the appropriate employment of the principles of Environmental Security are everywhere applying to all soldiers, anytime, and anyplace and limited only by the availability of resources to extend the educational package. Therefore, the design of distribution channels to make the "product/concept" available is literally always everywhere.

TRADOC has made a good start in the environmental world by integrating environmental concerns into the Programs of Instruction (POI) at each level of the Army education system. Similar efforts are underway to incorporate environmental concerns into policy and doctrine. By expanding the scope of the environmental efforts, the other elements of Environmental Security can be incorporated simultaneously.

Alternatively, based on fiscal analysis, it may be prudent to consider abandonment of the "vertical integration" of totally developing the training and marketing products "in-house" and consider the alternative of "out-sourcing", i.e. having contractors develop the program. One reason to consider this option is the fact that as the Army reduces in size, the best qualified technical personnel and appropriate facilities may no longer be available. Consequently, it may be cost effective to engage a contractor to develop, produce, and distribute this new training package.

A further reason is that "Producing everything in-house tends to...divert organizational focus away from the goal of giving value to the customer."[65] The Army's singular concerns should be educating, training, and instilling the Environmental Security ethic. Civilian contractors can design and distribute the training materials while soldiers concentrate on teaching.

Whatever the source, once an Environmental Security training package is developed, that content should be incorporated into every Army education opportunity. After soldiers

leave the formal Army schools, correspondence courses and distance learning[66] opportunities should be utilized. The concepts should be reiterated and continually nurtured by Commanders at all levels, eventually transforming the principles of Environmental Security into an Environmental Security ethic.

4.4.5 Promotion

The promotion of any new concept is achieved through a variety of techniques which include advertising, promotional events, public relations, and personal selling. Each venue should be included in launching the Environmental Security concept. The techniques mentioned above all have strengths and weaknesses. However, when used in conjunction with each other they can do much to attract soldier attention and generate an awareness of the topic.

Advertising, per se, is particularly helpful in establishing the Environmental Security image as a part of the personal armor of every soldier. Promotional events provide media opportunities to demonstrate the "customer focus" of Environmental Security and assist in educating soldiers to understand the new concept and the associated benefits for them. Finally, promotional items presented to soldiers can provide long lasting keepsakes that serve as constant reminders of the tenets of the program and assist in maintaining awareness.

At some ill-defined point, promotion merges imperceptibly with training and education. When marketing a concept as diverse and complex as Environmental Security, success would hinge almost exclusively on the capabilities of the "sales force."

> *Personal selling is the most individualized component in the promotion mix...personal selling is most appropriate...when the product is complex enough to need explanation and demonstration; and when the product benefits need to be tailored to fit the individual customer.*[67]

Thus, as promotion merges with training and education, the emphasis must shift to the Army school system where a coordinated educational program will utilize classroom techniques to develop a cadre of Environmental Security personnel who will serve as unit proponents of the concept.

4.5 Train and Educate the Force

The last critical element to be discussed is Train and Educate the Force. Training and education requires inputs from two avenues of approach.

As described above, a number of the concepts of Environmental Security have already been incorporated into Army schools at all levels. One of the first tasks for the DCS(ES) should be the development of an appropriate Program of Instruction (POI) to incorporate into all Army schools.

In addition to integrating the Environmental Security training program into the formal school system, a cadre of local Environmental Security Experts should be developed to serve as the "eyes and ears" for Commanders (as the focal point for Environmental Security concerns in the unit), and to provide specialized expertise at the unit level.

4.5.1 Unit Environmental Compliance Officer (UECO)

AR 200-1, Environmental Quality, dictates that commanders and managers appoint Unit Environmental Compliance Officers (UECO) at appropriate levels. The rank and title are immaterial. However, the degree of experience should be commensurate with the unit/organization missions and size. Further, the individual selected as the UECO should be qualified to assess the "...compliance requirements of that organization or unit, and amounts and types of training to be required (including training mandated by law or regulation)."[68]

4.5.2 Environmental Security Officers (ESO)

The concept of the UECO should be expanded to that of an Environmental Security Officer (ESO). Similar to the UECO, the ESO could be any grade, officer or enlisted, but, should be chosen from among individuals with an expressed interest and commitment to the ESO concept.

The ESO would be formally appointed on orders and would receive the same basic Environmental Security information provided each soldier through the Army school system. In addition, the ESO would be expected to take, on his own time, additional training in a variety of aspects of Environmental Security that have been described above. The additional training would be a requirement for maintaining the ESO appointment.

Since the requirements for documented training are dictated by regulation or law and appear to increase on an almost geometric basis, ESOs would be the most likely representatives from a unit to be selected to attend formal courses as they became available However, the majority of the augmented training would be attained through correspondence courses and distance learning and would not require attendance at a formal school.

For example, once the ESO had been appointed on orders, he would be eligible to take courses for handlers of biologic wastes, entomologists or sanitarians which are currently available through the AMEDD Center and School, but only for personnel with medical MOSs/AOCs. Reciprocally, courses now restricted only to engineer, chemical or safety personnel would become available to those with medical MOSs (Military Occupation Specialties).

Upon completion of the courses, certificates of training would be issued, and entries would be made in organizational and central personnel records. Once recorded in the personnel records, the additional training would serve as documentation for promotion points for enlisted soldiers, or, to substantiate continuing education for officer personnel.

4.5.3 Environmental Security MOS/AOC

As far back as 1990, an environmental Structured Requirements Analysis Planning group (STRAP) considered the concept of an Environmental MOS[69]. There are already a number of medical, safety, and environmental MOSs and AOCs which entail extensive specialty training and would make individuals imminently qualified to serve as ESOs. However, these specialty fields generally require a college degree. Soldiers with the advanced levels of training are 1) uncommon in Army organizational tables; 2) not available at the unit level, 3) would be immensely overqualified for the proposed ESO tasks; and, 4) are already "visible" and tracked through the personnel records system. Additionally:

- An MOS describes a "career field" in which an individual must work full time in order to take maximum advantage of utilization opportunities and career progression.

- An MOS requires an individual to always be assigned against that MOS. As personnel reductions continue, specific MOS assignments to specialized fields become an increasing nightmare for personnel managers.

- Since there would be only a single ESO per unit organization, the relative density of the ESOs would not be sufficient to justify the cost of developing an entirely separate MOS.

The Marine Corps (USMC) has several officer MOSs that fit with the concepts of Environmental Security and are similar to those existing in the Army. USMC Officer MOS9954 (Hazardous Material/Hazardous Waste Management Officer) is awarded after completion of a formal Marine Corps hazardous materials program. MOS9631 (Environmental Engineering Management Officer) requires a master's degree from an accredited institution of higher learning.

There are also two related enlisted MOSs, MOS 9954 (Hazardous Material/Hazardous Waste NCO and MOS 9956 (Ground Safety Specialist), which are awarded as "secondary" MOSs to combat arms Marines. The USMC has found that Marines who spend too much time in the secondary MOS do not end up "best qualified" for promotion past Staff Sergeant (E-6) and therefore are reluctant to encourage repetitive tours in the secondary MOS. Consequently, much of the additional training goes to waste. The Marine Corps is now contemplating a third intermediate MOS that would capture other tasks that environmental Marines are doing.[70] This MOS would have a skill pattern very similar to those desired for soldiers.

The Air Force and the Navy have no need for an additional or intermediate MOS. Even when deployed, the Air Force must operate from relatively permanent facilities due to the maintenance requirements of the aircraft, and the Navy operates from a ship. Consequently, there are few field Environmental Security concerns because there is always "installation support" in the near vicinity.[71]

Thus for these reasons, and, particularly in view of the Marine Corps experience with an environmental MOS, the concept was discarded.

4.5.4 Additional Skill Identifier (ASI)

The ESO would be expected to be a specialist in "breadth" on a variety of subjects and not a specialist in "depth" on any given topic. The ESO would serve as the eyes and ears of the commander to alert him to potential ES concerns that would require more detailed evaluation. He would be knowledgeable enough to raise questions about controversial ES matters, and know where to seek further assistance for concerns that exceeded his level of capability. Therefore, the concept of the Additional Skills Identifier (ASI) appears more appropriate than an MOS.

The concept of an Additional Skills Identifier (ASI) was first broached at an environmental STRAP held in April 1990.

The final report from that meeting includes the statement "will identify approach to military environmental skill identifiers."[72] Also, the ASI was discussed and the Senior Environmental Leadership Conference (SELC) in Williamsburg, VA in 1992.[73] At that time "the Army Environmental Office(AEO) was requested to comment on the potential/need for an environmental ASI for military officers....AEO determined there were far too few environmental positions/assignments in the Army to make setting up and managing such an ASI worthwhile. Questions of an ASI for NCOs/enlisted soldiers, or of an ASI for 'additional duty' environmental requirements, were not addressed"[74], so the idea was abandoned.

However, "In FY94 the Director of Environmental Programs (DEP) directed a re-look at the issue....Before any final decision was made, both the assigned ODEP staff officer in charge and the DEP himself had left the Army. No further action was taken."[75]

It is of interest that all these activities occurred prior to the re-write of AR 200-1, which prescribes the greatly enhanced duties and responsibilities of the Environmental Compliance Officer.[76] Thus, as stated in the Information Paper cited previously, "Official Army sanction for such additional duties may eventually lead to further consideration of the ASI question as it applies to officers or NCOs with these assignments."[77] Yet another window of opportunity to establish an ASI would open with the consolidation of programs into Environmental Security.

4.5.5 ASI Preferred Over MOS?

The establishment of an ASI for Environmental Security would provide a way to track individuals with an inclination toward Environmental Security. AR 611-201, Enlisted Career Management Fields and Military Occupation Specialty, states an "ASI may be used to identify specialized qualifications and requirements that do not adhere to the MOS management system...."[78] The reference goes on to say that the

"Establishment of an ASI will be considered if a formal course of instructions of at least 10 days is established to award that ASI."[79] There is also another option available to establish the ASI "if the credit for the course can be obtained by correspondence course or other formalized training."[80]

An ASI should be MOS/AOC immaterial. The precedent for such an arrangement is well established, by ASI P5-Master Fitness Trainer,[81] or, ASI 2S-Battle Staff Operations.[82] Although soldiers holding some MOS/AOC will be more likely to gravitate toward the ASI e.g. engineering, chemical, medical, etc., a specific MOS/AOC should not be a requirement. This would ensure that there is a potential for every organization, regardless of type, to develop an Environmental Security Officer capability from within its own ranks.

There is already a reservoir of partially qualified personnel available. Every unit down to company level has positions identified for supply and an NBC NCO. Each of these individuals already knows many of the precepts that would be followed by the Environmental Security Officer (ESO) as a consequence of daily duties. Therefore, supply and NBC personnel could be utilized to provide the first fills for ESO positions and would require a minimal amount of additional training.

To the greatest extent possible, any required additional training should be made available by correspondence courses, or, through on the job training at an Installation. This opportunity for training can be achieved by extracting correspondence courses from other specialty areas and incorporating them into the requirements for the ASI. This training, and distance learning opportunities would augment, the training already acquired through the TRADOC schools system.

4.5.6 Promotion Points

Completion of the required course of study would provide promotion points for enlisted soldiers and evidence of continuing education for officers. Further, some of the course

work may serve as college equivalents and thus be eligible for college credits. Courses would require clear description to make the equivalency criteria obvious.

Thus, the ASI would be a win-win situation. From the Army's point of view, it would serve to promote the Environmental Security ethic by providing military units with trained Environmental Security "specialists". The soldier would win as the ASI would make him eligible to learn new skills and simultaneously earn credits toward promotion or continuing education.

The greatest benefit would arise from the force multiplier effect acquired as a consequence of minimizing the environmental distractions for commanders. Increasingly, consideration of the welfare not only of soldiers, but also of the natural environment is becoming one of the nation's criteria for deciding the success or failure of military operations. Force XXI and the Army After Next must be able to fight and win on the field of battle without destroying the field of battle. Winning the hearts, minds, and conscience of Americans will be the political war to be won as the final determinant of victory.

4.5.7 Alignment of Civilian Career Programs with DASA(ESOH)

At the same time an ASI is reconsidered for soldiers, a further alignment of the ESOH family under the Deputy Assistant Secretary of the Army, Environment and Occupational Health (DASA(ESOH)) should be considered. Currently, the civilian career progression aligns personnel involved in Environmental Security under two different program managers.

The Career Progression 18 Series (CP18) (Environment), is managed by the Army Corps of Engineers through the Chief of Engineers. The CP12 Series (Safety and Occupational Health) is managed by the DASA (ESOH) . This classic example of divided authority and responsibility (remnants from the uncompleted Livingstone realignment cited earlier) tends to split the civilian work force and gives the perception of partial-

ity and indifference on the part of the program managers. Therefore, control of the environmental career program should be realigned parallel with safety since responsibility for the morale and productivity for both programs ultimately falls under the purview of the DASA(ESOH).

5. Conclusions

Army Force Protection programs are designed to conserve the fighting force by reducing the attrition in combat power that results from disease and nonbattle injuries. The programs have traditionally focused on protecting the soldier from hostile environmental threats, both natural and human. Recently, increasing concern has been voiced for the concept of protecting the environment from the soldier. This concern has dictated a requirement for a force protection program that balances mission and force protection requirements with those of environmental protection.

Since force protection programs have evolved in a piecemeal fashion, there is great amount of simultaneous accord and discord among the component disciplines. There is equal fragmentation in command and control. The lack of coordinated leadership enables the risk of significant attrition in combat power when critical aspects of the programs are slighted. In order to achieve the "Full Spectrum Dominance" and "Full Dimensional Protection" dictated by Joint and Army Visions 2010 it is imperative that a holistic approach to force protection be employed.

The DoD concept of Environmental Security combines all the components of the ultimate force protection plan; environment (restoration, compliance, conservation, pollution prevention), safety, occupational health, explosives safety, fire and emergency services, pest management, environmental security technology, and international activities into a single program under the Deputy Undersecretary of Defense, Environmental Security (DUSD (ES)). The Army Secretariat has partially emulated this concept by designating a Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health (DASA(ESOH)). It would be practical and efficient for the Army to extend the concept of ES from the Pentagon to the foxhole.

To implement such an extensive program which crosses many parochial boundaries, a Deputy Chief of Staff-Environ-

mental Security (DCS-ES) (0-8) would be designated with three (0-7) subordinates - the already established Directors of Army Safety and Environmental Programs, and, the Commander, U.S. Army Center for Health Promotion and Preventive Medicine. This triumvirate, under the leadership of the DCS-ES, would be responsible for recommending the appropriate Army ES proponent and developing a coordinated budgeting, training, education, and marketing plan for the concept.

An Additional Skill Identifier (ASI) for ES would also be included. ES responsibilities increase almost daily, weighing heavily on commanders' minds. The provision of additional expertise at the unit level would assist the commander by serving as an extension of his "eyes and ears," provide a soldier mentor for instilling the ES ethic, and continually raise awareness for ES. Additionally, as the military programs are combined under the command and control of a single DCS-ES, the civilian Career Progression series, CP12 (safety) and CP18 (environment) would be combined under the DASA(ESOH).

By aligning all force protection disciplines as part of a continuum beginning at the Pentagon and extending to the foxhole, Environmental Security would combine the effects of a wide variety of disciplines that individually have relatively small impacts, but, in combination have effects greater than the sum of the parts. This enhanced benefit can mean the difference between winning or losing a soldier or even a conflict.

Finally, the increased efficiencies in current programs would serve as force multipliers by raising the awareness for ES and reducing the mission distraction heaped upon commanders. The result would be a savings in manpower and other resources through the elimination of duplicate and redundant agendas. Since Environmental Security under the DoD definition is applicable to all services, the concept may also be embraced from a joint perspective with further improvements in economy.

6. Issues and Recommendations

Army Force Protection programs are designed to conserve the fighting force by reducing the combat power attrition that results from disease and nonbattle injuries. The programs have traditionally focused on protecting the soldier from hostile environmental threats, both natural and human. Recently, increasing concern has been voiced for the concept of protecting the environment from the soldier. This concern has dictated a requirement for a force protection program that balances mission and force protection requirements with those of environmental protection.

ISSUE: Army force protection programs are spread across virtually every command and functional staff area with no central coordination.

COMMENT: The success of force protection relies on the integration of the components into a single program with a single mission: reducing attrition. The impact of the various programs is small when they are viewed individually. However, in the aggregate their combined effects can mean the difference between winning or losing a soldier or even the conflict. The various components of force protection are currently arrayed across the Army organization in a bewildering fashion, each program driven by different authority through a separate chain of command with no central integration.

RECOMMENDATION: Army force protection activities should all be combined into a single program, Environmental Security, in accordance with the DOD definition of Environmental Security.

ISSUE: As a consequence of the fragmentation in Army force protection programs, there is no single advocate who represents the concept across the full spectrum of the Army organization.

COMMENT: There are presently at least two general officers primarily involved with force protection activities (Commander, USACHPPM; Director, Army Safety Program), the 0-6 Director of Environmental Programs, and, a force protection "slice" in each of the functional general and special staff sections. Again, there is no directed coordination of activities between the elements concerned, and consequently there are "seams" between the programs that offer the potential for errors and oversights.

RECOMMENDATION: Appoint a Deputy Chief of Staff-Environmental Security to provide leadership and management for a coordinated ES program. Align the Director of Army Safety; Commander, USACHPPM; and, Director of Environmental Programs as subordinates of the DCS-ES.

ISSUE: There is no single authority to represent the broad spectrum of concerns in Environmental Security.

COMMENT: The lack of a single force protection program has allowed the spread of the various components of ES among a variety of Army schools at a variety of locations. This physical separation further contributes to the lack of coordination and integration among the various disciplines

RECOMMENDATION: Designate an Executive Agent for Environmental Security. The Executive Agent will be responsible for developing integrated ES doctrine, training, and education programs and requirements, and will also serve as the proponent.

ISSUE: The increasing responsibilities associated with Environmental Security and the concepts associated with protecting the soldier from the environment and the environment from the soldier have markedly extended and stretched the capabilities and obligations of leaders.

COMMENT: The recent inclusion of environmental concerns as an integral aspect of all army operations and training has significantly increased the obligations of commanders to be aware of the environmental impacts of every action. The extent of this involvement can become a mission distraction. Consequently, the unit commander should be offered some assistance at the unit level to assess environmental security problems and address them appropriately. An Additional Skill Identifier (ASI) to designate an environmental security expert could be developed. A considerable amount of parallel education already occurs among supply personnel and chemical corps personnel of all ranks. Individuals could earn the ASI through distance learning and serve as the "eyes and ears" of the commander, and as a unit mentor for all environmental security matters.

RECOMMENDATION: A branch immaterial Additional Skill Identifier (ASI) for the Environmental Security Officer should be developed.

ISSUE: Department of the army civilians working in Environmental Security are directed by different career program managers.

COMMENT: DA Civilians who would comprise the civilian work force in environmental security are controlled under the CP18 series (environment) which is managed by the Chief of Engineers while the CP12 series (safety and occupational health) is managed by the DASA(ESOH). Since the DASA(ESOH) would be responsible for all aspects of the proposed Environmental Security program this makes a classic division of responsibility and authority in management. Worse, it contributes to a perception of indifference and partiality on the part of the managers.

RECOMMENDATION: Combine the management of civilian career progression series, CP18 (environment) with the CP12 series (safety) under the management of the

DASA(ESOH). The move will align the authority and responsibility for the related fields under a single manager.

ISSUE: "Marketing" the concept of Environmental Security will be difficult because it will require combining a number of separate programs which have established, vocal advocates. It will also force the confirmation, consolidation, or elimination of some existing programs with the corresponding loss of control over institutionalized programs and budgets.

COMMENT: The major flaw in current force protection programs is the total lack of integration. With a focus on soldier and environmental protection, safety, and well being, it is unconscionable to allow the existence of seams between the various disciplines to weaken the overall efficacy of the program. The establishment of a DCS-ES will do much to lend credibility and visibility to Environmental Security. However, a determined marketing program driven by determined leadership is the only way that the proposed program will succeed. Once the leadership is selected one of the first tasks must be the development of a vigorous marketing strategy.

RECOMMENDATION: Develop and implement a formal marketing scheme to spread the environmental security ethic.

ISSUE: Environmental Security is a concern of all U.S. armed forces. The components of Environmental Security (safety, environment, preventive medicine, occupational health, pest management, etc.) affect all the services.

COMMENTS: Environmental Security could be a common ground on which to build a true Joint Environmental Security program. As budgets are decreased, and since DOD has defined the term Environmental Security, there may be an opportunity to obtain DOD subsidy for the ES program. Since virtually all operations are now Joint, it makes little sense to duplicate efforts among the services. Although each service may have

some unique needs, the vast majority of ES concerns should be congruent. A Joint ES program could provide a remarkable return on investment and provide another way to cement Joint relations.

Also, since the Assistant Secretary of Defense-Health Affairs (ASD-HA), and the Under Secretary of Defense-Personnel and Readiness (USD-PR) have already taken the lead in some Environmental Security concerns related to Joint Medical Surveillance. Utilizing the Joint Environmental Security alternative in concert with ASD-HA authority has the greatest potential for resource and budget savings while eliminating duplicate and redundant organizational structures in each of the various services. On the down side, it would obviously remove the programs entirely from Army oversight.

RECOMMENDATION: The Army should host a working group to examine the potential formation of a Joint Environmental Security program.

References

[1] MG Robert Scales, U.S. Army News Release, Army Pub lic Affairs, Washington, DC 20310, Pentagon briefing 97a-77, July 10, 1997, p. 8 http://www.dtic.mil/armylink/news/jul1997/r19970710aanbrf.html.

[2] Ibid., p. 8.

[3] Personal communication (e-mail), LTC Steven Richards, (Industrial Hygiene) ASA-IL&E, June 25, 1998.

[4] Textbook of Military Medicine, Part IV, Anesthesia and Perioperative Care of the Combat Casualty, Office of the Surgeon General, U.S. Army, ed. BG Russ Zajtchuk, 1995, p. 2.

[5] Joint Pub 4-02, Doctrine for Health Services Support in Joint Operations, April 26, 1995, p. GL-4. DNBI (disease and nonbattle injury casualty). A person who is not a battle casualty but who is lost to the organization by reason of disease or injury, including persons dying of disease or injury, by reason of being missing when the absence does not appear to be voluntary, or due to enemy action or to being interned. (Approved for inclusion in the next edition of Joint Pub 1-02).

[6] Ibid., p. 4.

[7] Neel, Spurgeon. Medical Support of the U.S. Army in Vietnam 1965-1970. Department of the Army, U.S. GPO, Washington, DC. 1974.

[8] Unpublished data, supplied by D.S. Ricketson, USASC, June 11, 1998.

[9] FM100-5, Operations, June 1993, pp. 2-11 and 2-12.

[10] FM100-5, pp. 2-11.

[11] Joint Pub 4-02 p. 1-1. (Same as #4 above).

[12] USACHPPM Regulation 10-1,Organization and Functions, USACHPPM ,Deputy for Technical Services, Organization Diagram, p. 3, August 11, 1997.

[13] AR385-40, Safety, Accident Reporting and Records, p. GL(glossary) II, November 1, 1994.

[14] Plog, Barbara, Editor, Fundamentals of Industrial Hygiene, The National Safety Council, Itasca, IL, 1996, p. 3.

Industrial Hygiene is that science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace that may cause sickness, impaired health and well-being, or significant discomfort among workers or among the citizens of the community." Army programs include the "DA asbestos and lead hazard management, respiratory protection, health hazard communication, safety, hazardous materials, hazardous waste management, and installation restoration programs." From USACHPPM Reg. # 10-1, Organization and Functions, October 1, 1997, p. 44.

[15] Stanhope, Marcia and Lancaster, Jeanette, Community Health Nursing, Mosby Year Book, 3rd Ed., 1992, Baltimore, Glossary. Occupational Health: Special field of preventive medicine concerned with the medical problems and practices relating to occupation and especially to employees of industry." The Army programs include entomology, pest management, Lyme Disease, ergonomics, Health Hazard Assessment, ionizing radiation hazards, blood borne pathogens, fire safety evaluations, etc. From USACHPPM Reg #10-1, Organization and Functions, October 1, 1997. pp. 39-49.

[16] Center for Army Lessons Learned Newsletter, 93-9, dtd December 1993, Ft. Leavenworth, author D.S. Ricketson, on the Internet: http://call.army.mil/call/newsltrs/93-9/939toc.htm.

[17] Force Protection (Safety) Functional Area Assessment (FAA), U. S. Army Safety Center, Fort Rucker, AL 36362, 4 October 1995, p. 23.

[18] Ibid., p. 10.

[19] Army Environmental Strategy XXI (draft), Army Environmental Policy Institute, 1998, p. 2.

[20] Personal communication with Mr. Bob Layman, U. S. Army Engineer School, Fort Leonard Wood, MO, November 20, 1997, Diagram entitled "U. S. Army Environmental Trace."

[21] FM 100-16, Support Operations at Echelons Above Corps, April 1985, pp. 9-1.

[22] Environmental DTLOMS Integration Plan (EDIP), November 1, 1996, USATRADOC, Para. 3.2.2.

[23] U.S. Army Chemical Center and School BRAC Book, 1994.

[24] Miller, Roy D., and, Hudson, J. Neil; Final Report Assessment of the Health Role in Environmental Programs, December 31, 1997.

[25] Ibid., p. 7.

[26] Uniformed Services University of the Health Sciences, Department of Preventive Medicine and Biometrics, Division of Environmental and Occupational Health. Quarterly Progress Report on Assessment of the Health Role in Environmental Programs, June 12, 1997, p. 6.

[27] Surprisingly, even related disciplines may be placed in contrary positions as competing value systems compete for priority among mission requirements. For example, a commander may choose a tactically sound location for a bivouac site where is hard stand to support vehicles, little risk of flooding, and minimal damage to vegetation which equates to a very low environmental impact. However, the environmental health assessment may void the previous choices for environmental health reasons due to the fact that the site is located downwind from an industrial smelter.

[28] Of peculiar interest, the USUHS study totally excluded all consideration of TO&E (Table of Organization and Equipment) units, commonly referred to as "line units" or "the warfighters" the one group all the force protection programs are designed to support and benefit.

[29] Ibid., p. 9 (USUHS REPORT #12 above)

[30] "The integration of environmental health with environmental programs as practiced by AEC-CHPPM and AAPSO (Army Acquisition Pollution Prevention Support Office) are positive examples of how the partnership should work." Ibid., p. 14 (USUHS #12 above).

[31] Ibid., p. 11 (USUHS Report #12 above).

[32] Ibid., p. 76 (USUHS Report #12 above) Included as an Appendix.

[33] Occupational Health is a very "compartmentalized."

[34] Annual Report to the President and the Congress, William S. Cohen, Secretary of Defense, April 1997, Chapter 14, Environmental Security, p. 125.

[35] Joint Vision 2010, CJCS, 5126 Joint Staff, Pentagon, Washington, DC 20318-5126, p. 20.

[36] Ibid., p. 21.

[37] Ibid., p. 24.

[38] Ibid., p. 22.

[39] Ibid., p. 22 (italics inserted by author).

[40] Ibid., p. 24.

[41] Army Vision 2010, Chief of Staff, Army, Pentagon, Washington, DC, 1997, p. 10.

[42] Ibid., p. 11.

[43] Ibid., p. 12.

[44] Ibid., p. 13.

[45] Ibid., p. 15.

[46] Ibid., p. 14.

[47] It is curious that although the Annual Report to the President and the Congress uses the term "environmental security" as a collective term to include many of the various components of force protection, the military documents appear reticent to use the term. Instead they substitute a variety of phrases to include "full dimensional protection", "seamless joint architecture for force protection" and "The Army's approach will be a holistic one,...protecting soldiers, information and equipment across the full spectrum of the operating environment."

[47] Department of Defense Directive (DODD) 4715.1, SUBJECT: Environmental Security, February 24, 1996, Encl. 2.

[48] AR200-1, Environmental Protection and Enhancement, February 21, 1997, p. 1, Para.1-1a.

[49] Ibid., p. 2., Para. 1-11a.

[50] In some ways, Environmental Security can almost be viewed as milieu therapy, "...defined as the purposeful use of people, resources, and events in the client's (soldier's) immediate environment to protect optimal functioning in the activities

of daily living..." Wilson, Holly, and Kneisl, Carol, Psychiatric Nursing, Benjamin-Cummings Publishing Co., Inc., New York, 1992, p. 743.

[51] *U.S. Environmental Strategy into the 21st Century*, Army Environmental Policy Institute, p. 24.

[52] TRADOC, Environmental DTLOMS Integration Plan (EDIP), November 1, 1996, Para. 2.16.

[53] Ibid., #35 above, p. 10.

[54] "...(the) team of professionals provides worldwide scientific expertise and services in the areas of - Clinical Preventive Medicine, Deployment Medical Surveillance, Environmental Health Engineering, Epidemiology and Disease Surveillance, Field Operations and Readiness, Health Promotion and Wellness, Laboratory Sciences, Occupational Health Services,(and) Toxicology." U.S. Army Center for Health Promotion and Preventive Medicine, Internet Website, http://chppm-www.apgea.army.mil, "Our legacy", p. 2.

[55] Briefing: The Army Environmental Organization, Slide #2, at Tab A from Livingstone letter packet.

[56] In a November 20, 1996 speech to the American Society of Engineers, in Washington, DC, Secretary of Defense William J. Perry stated, "...Indeed we take our environmental responsibilities seriously. That is why, three years ago we created the Office of Environmental Security at the Pentagon, and appointed Sherri Goodman to coordinate and lead our efforts at the highest levels. That is why the Services have each appointed a flag officer to lead environmental, safety, and occupational health activities in the ranks." It is therefore, curious that BG Brown has never been replaced.

[57] Ibid, Safety FAA, p. 10.

[58] Information Paper, SUBJECT: Environmental Training, dated 17 Feb 98, Timothy Julius /693-0543.

[59] USUHS report cited earlier, p. 34.

[60] Department of Defense Directive, Joint Medical Surveillance, dated August 30, 1997.

[61] Department of Defense Instruction (DODI)6490.2, Implementation and Application of Joint Medical Surveillance for Deployments, dated August 7, 1997.

[67] Murphy, Dallas, The Fast Forward MBA in Marketing, John Wiley and Sons, Inc., New York, NY, 1997, p. 4.

[68] Ibid., p. 249.

[69] See Appendix E of the USUHS paper.

[70] Kaoru Ishikawa, What is Total Quality Control? The Japanese Way, Englewood Cliffs, N. J.: Prentice Hall, 1985, p. 32.

[71] Distance Learning-"The delivery of education or training through electronically mediated instruction including satellite, video, audiographic computer, multimedia technology and other forms of learning at a distance." U.S. Distance Learning Association (USDLA). From a slide presentation on Distance Learning, DRIC '97 Users Meeting and Training Conference, 3 November 1997. Internet http://www.dtic.mil/dtic/annualconf/dis-learning.ppt.

[72] Ibid., #43, p. 91.

[73] AR 200-1. Environmental Quality, Environmental Protection and Enhancement, 1-32f, February 21, 1997.

[74] Final Report, Army Installation Environmental Management STRAP(Structured Requirements Analysis Planning) for Installation Environmental Management Requirements, Appendix: Original Improvement Opportunity #12, "Need MOS for environmental skills." Chair: J. Harold Mashburn, Arlington, VA, April 4-5, 1990.

[75] Personal correspondence from Capt David S. Cook, Legal Counsel, HQMC(LFL),2 Navy Annex, Washington, DC20380-1776, dated May 7, 1998.

[76] Personal conversation with COL. F. Thomas Lubozynski, Chairman, Department of Bioenvironmental Engineering, USAF School of Aerospace Medicine, Brooks AFB, TX 78235, May 1998.

[77] The Original Improvement Opportunity #12 ("Need MOS for environmental skills.") cited earlier was replaced at the STRAP meeting by Adopted Improvement Opportunity #11 "Will identify approach to military environmental skill identifiers."

[78] Mashburn, J. Harold, conversation with author, Army Environmental Policy Institute (AEPI), Atlanta, GA, April 23, 1998.

[79] Information Paper, S. E. Thomas, USAEC, SUBJECT: Environmental Additional Skill Identifier (ASI) for Military Personnel, Para 1 and 1a.

[80] Ibid., Para 2.

[81] The proposal in this paper would expand those capabilities even more to include all the relevant elements of the Environmental Security Officer.

[82] Ibid., Para. 5.

[83] AR611-201,Enlisted Career management Fields and Military Occupation Specialty, June 26, 1995, Paragraph 6-1b. p. 587.

[84] Ibid., Para 6-2f.

[85] Ibid., Para 6-2g(b).

[86] Ibid., p. 592.

[87] Ibid., p. 597.