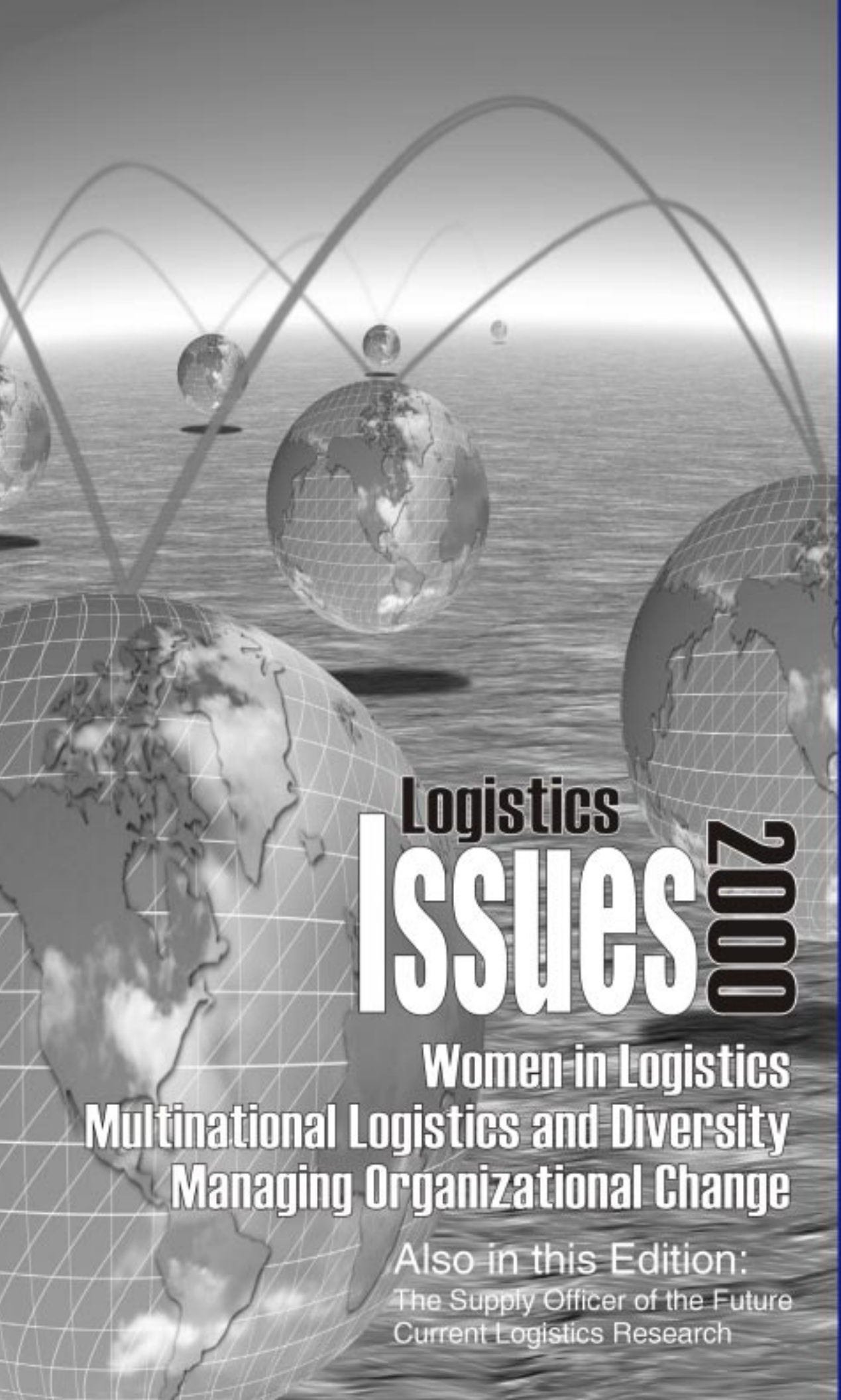

Air Force Journal of Logistics

Logistics Issues 2000

Women in Logistics

Multinational Logistics and Diversity

Managing Organizational Change

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Volume XXIV,
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ISSUES 2000

4 **Women in Logistics**
James C. Johnson, PhD
Diane J. McClure
Kenneth C. Schneider, PhD

10 **Multinational Logistics—Managing Diversity**
Lieutenant Colonel Frank Gorman, USAF

18 **Cultural Change in the Organization**
Major Cassie B. Barlow, USAF, PhD
Allen Batteau, PhD

ARTICLES

3 **Light, Lean, and Lethal—Logistics Lessons from the Little Bighorn**
Colonel Richard M. Bereit, USAF, Retired

23 **The Supply Officer of the Future**
Major General James W. Hopp, USAF, Retired

29 **Theater Air Mobility: Historical Analysis, Doctrine, and Leadership**
Major Ted E. Carter, Jr, USAF

DEPARTMENTS

26 **Current Logistics Research**
AFMC Studies and Analyses Program

General Michael E. Ryan
Air Force Chief of Staff

Lieutenant General Michael E. Zettler
Deputy Chief of Staff, Installations and Logistics

Colonel Ronne G. Mercer
Commander
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Light, Lean, and Lethal

Logistics Lessons from the Little Bighorn

Colonel
Richard M. Bereit
USAF, Retired

In this country . . . no man need fail in life if determined to succeed . . . ."

—Major General George A. Custer

Custer's Last Stand

On 25 June 1876, 211 Americans (soldiers, scouts, journalists, and contractors) were struck down near the Little Bighorn River. Every soldier under Lieutenant Colonel Custer's (Brevet Major General George Armstrong) direct command was killed, a rare occurrence in US military history. What went wrong? What impact did logistics have on shaping the battlefield and forces? And most important, what are the lessons that would prevent American forces from suffering such a defeat again?

A Young but Proven Leader

Custer's own credentials were impeccable. He was a West Point graduate, a superb cavalry officer, and the youngest soldier to be made a brevet brigadier general in the history of the US military.[1] When promoted to brevet major general, he was the youngest American to ever hold that rank.[2] Military historians rank Custer below only General Philip H. Sheridan and Major General Alfred Pleasonton as an American cavalry tactician and field commander.[3] Custer was schooled and experienced, and he understood the importance of logistics. He was also notorious for his willingness to attack a larger force.[4] On the last and most critical day of the Gettysburg campaign, Major General George G. Meade's army stopped Major General George E. Pickett's charge at the center-front of the line. It was Custer's (age 23 and recently promoted to brevet brigadier general) Michigan Cavalry that repulsed the cavalry attack by Major General J. E. B. Stuart's Invincibles at the Union rear.[5] In the final days of the war, Custer's cavalry rushed to Appomattox Station to capture four Confederate supply trains, which Lee desperately needed. Cut off from both his supplies and his means of escape, Lee surrendered.[6]

Pursuing an Elusive Enemy

As Custer headed up the Rosebud River on 22 June 1876, his soldiers and packtrain carried supplies for a 15-day march. His orders were to march to the headwaters of the Rosebud, looking for the main Sioux camp. Each man carried 100 rounds of ammunition for his carbine and 24 rounds for his pistol.[7] Brigadier General Alfred H. Terry's (Major General) and Colonel John Gibbon's (Brigadier General) forces were to travel aboard the riverboat *Far West* up the Yellowstone and Bighorn Rivers, as far as water depth would allow. The combined forces of Gibbon and Terry, moving by river from the north, were to link up with Custer's force, coming overland from the south, thus trapping the Sioux between them.[8]

Based on Custer's own estimate of distance and speed of 25-30 miles per day, the rendezvous was to be made on 26 June. However, on the 24th, Custer increased the normal rate of march to 40 miles by traveling most of the night and early morning.[9] Consequently, he reached the headwaters of the Rosebud at around 3:15 a.m. on the 25th. This accelerated pace left horse and soldier tired and hungry. After only a short rest, he continued another *12 miles that same day*.[10] Custer's scouts had sighted campfires from a very large Indian village, approximately 14 miles to the north on the west bank of the Little Bighorn River. He knew he was closing in on his prey but was not convinced this was the main village.[11]

At this point, he divided his force into four components. Three troops (125 men) under Captain Frederick W. Benteen (Brevet Brigadier General) were sent northwest at a 45 degree angle to scout for Indians to the west of the Little Bighorn River and provide defense on the left flank. Major Marcus A. Reno (Brevet Brigadier General) with three troops (140 men) was sent up the center to attack the village from the south.[12] Seven soldiers from each of the other 11 troops were detailed to Captain Thomas M. McDougall (Brevet Brigadier General) to guard the packtrain and baggage. These 130 men were more than 20 percent of the total regiment.[13] Custer took five troops (225 men and most of the scouts) with him. He ordered an increased

(Continued on page 38)

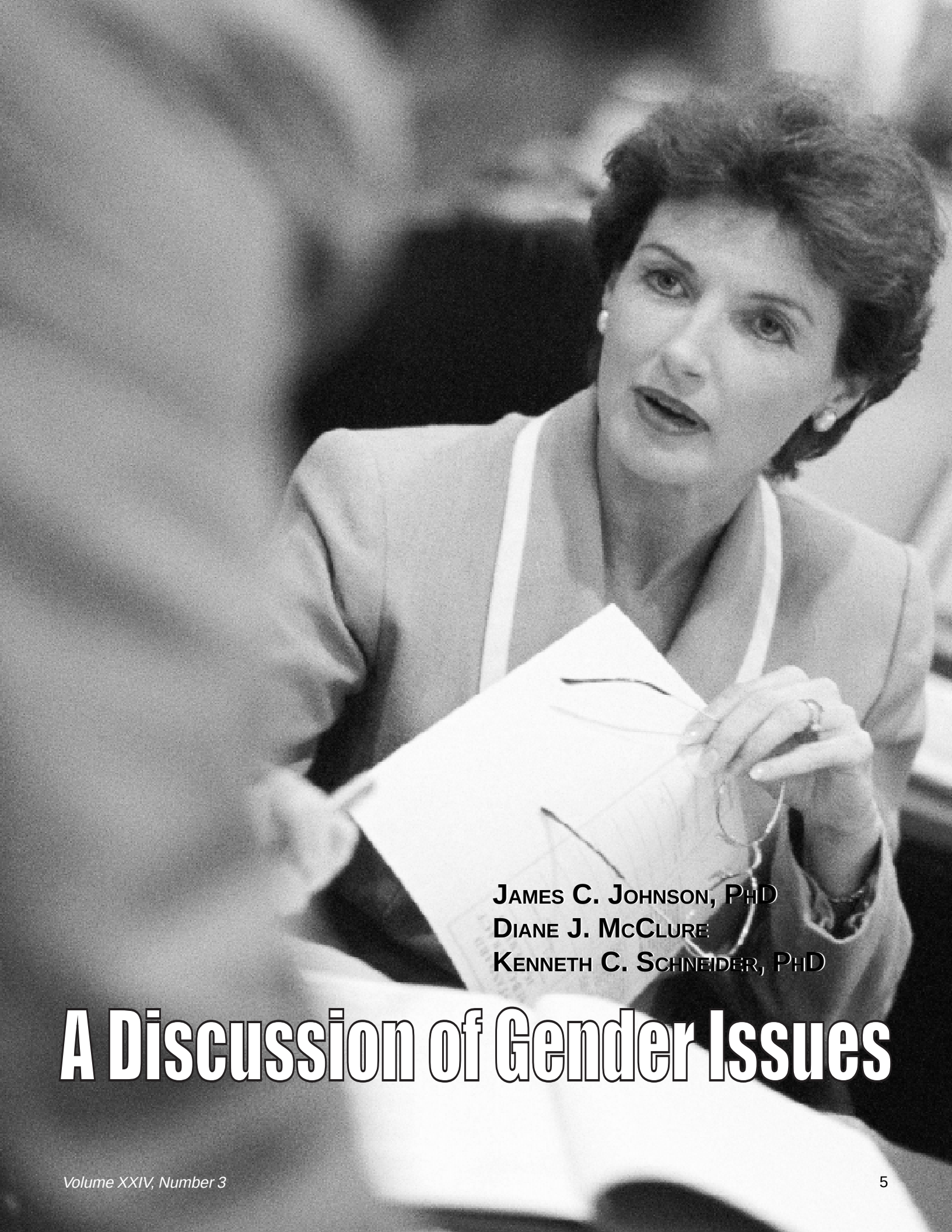
Many companies have a strong desire for more female executives for two reasons: not enough competent males to fill the management positions and a need to better understand women customers.

Women in Logistics

Issues 2000

In recent years women have accounted for more than half of all college undergraduate students in the United States. In 1999, women earned 57 percent of all bachelor's degrees awarded in the United States, compared to 43 percent in 1970 and less than 24 percent in 1950.[1] Many women have majored in business or related areas and are now working in management positions. While there have been a limited number of academic studies that have examined women in the transportation/logistics industry,[2] none has asked women logisticians the two significant questions contained in this survey regarding the impact of gender on their careers.

A number of recent books written by women have noted that many females, although they have entered the work force, are not feeling fulfilled in the business world.[3] This situation is also indicated by a public opinion poll conducted by Roper Starch Worldwide. In 1973, 41 percent of women workers reported being



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A Discussion of Gender Issues

"very satisfied" with their work. By 1994, this percentage had declined to 26 percent.[4] There are many reasons for this situation:

- Not enough time for family obligations.[5]
- Men ignore the ideas of women because their male egos are threatened.[6]
- Sexual harassment in the workplace.[7]
- Work itself has proven to not be satisfying.[8]
- Excessive stress in the workplace.[9]
- The need to conform in the corporate work environment.[10]

Because of these and, undoubtedly, other frustrations, women managers are opting to start their own businesses. The National Foundation for Women Business Owners reported that female-owned businesses increased by 42 percent from 1992 to 1999.[11]

There are two reasons many companies have a strong desire to have more female executives: there are not enough competent males to fill all the management positions and the need to better understand women consumers.[12] As a result, many companies that have not been successful in retaining and promoting women have started aggressive actions to correct this deficiency.[13] However, it should be noted that many women have achieved very senior management positions in America's most prestigious companies.[14]

Research Methodology

To better understand the management issues noted above, a sample of female logistics and transportation professionals was surveyed. A systematic random sample of 500 female logisticians was selected from the Council of Logistics Management Membership Directory. Consultants or professors at colleges or universities were eliminated. A questionnaire and a letter urging participation was sent to each of the 500 logisticians. Approximately 10 days later, a thank you letter was sent to the respondents, and a reminder letter, along with another copy of the questionnaire, was sent to those who had not responded.

Altogether, usable responses were received from 146 female professionals, representing 146/500 = .292, or 29.2 percent of the initial sample. Considering the professional status of those contacted, this response rate was very good. Responses from these 146 female logisticians form the database for the survey results.

In terms of respondent demographics, 13.2 percent were under age 30, 34.7 percent were 30 to 39, 41.7 percent were 40 to 49, and 10.4 percent were age 50 and over. Looking at education, 19.2 percent of the respondents had not graduated from college, 42.4 percent were college graduates, and 38.4 percent had graduate degrees. Finally, in terms of annual income, 22.5 percent of the respondents had an income close to $40,000; 33.3 percent—$60,000; 15.9 percent—$80,000; 13.8 percent—$100,000, and 14.5 percent had an income of $120,000 or more.

Greatest Gender-Related Career Surprise

Each female respondent was asked, "What has been the *one* greatest surprise that you have encountered in your career because of your gender?" The respondents' answers were categorized into seven general themes, each of which will be examined in the descending order that they appeared. (There were 11 respondents—7.5 percent of the total—that either did not respond to this question or who answered in such a way their responses were categorized as *miscellaneous*.) Representative respondent comments are included so the reader can gain some measure of the character of the statements.

Women Not Respected As Professionals

Fifty-four women (37.0 percent) stated their greatest gender-related surprise in the transportation/logistics area has been the lack of respect because they are women. This frustration was noted more than twice as often as any other response to this question.

> As a female, I am not taken seriously. Customers refuse to believe I am the manager and insist on speaking with the *real boss*.

> How men in transportation still tend to talk down to you (for example, honey and babe) and their lack of respect for women's mental abilities.

> I am constantly being patronized; men in supply chain management are sure we are *tokens* hired for affirmative action programs, hence, we know nothing about transportation and logistics. Many also believe women do not have the mental capacity to learn this area.

> People treat you differently. I used to believe the more education a person had the less likely they would be sexist. I now know that some men, regardless of their level of education, believe all aspects of distribution are the domain of men. They seem really perturbed that females are entering this male bastion.

> The fact that gender does matter. I naively believed skill, dedication, and knowledge were all that counted. I was wrong.

> Male coworkers and managers still associate women with clerical work and do not assign challenging workloads or career paths to women, which prevents our equal opportunity for career advancement.

No Discrimination

The second greatest surprise was they had encountered no discrimination based on gender. This point was made by 26 women or 17.8 percent of the survey participants.

> I have experienced no discrimination based on gender. I have spent my entire career at the same company, and I have progressed from intern (non-paid) to entry level, to supervisor, to general manager, to director, and now assistant vice president.

> I'm *surprised* that I'm treated like one of the guys and my opinions are valued. I've heard about the *glass ceiling*, but I have never experienced it. Generally, women's magazines have a *poor me* attitude that I don't think is very beneficial to women readers.

> I really never felt my gender played a role in my acceptance as a professional, and I work in a male-dominated company and industry.

> In my company, performance counts and not gender. I have been very pleasantly surprised that this issue is not a concern at my company.

> Acceptance into a male-dominated field has been easier than anticipated. Once you prove yourself as being knowledgeable and capable, most men in this field give you their respect and support.

Great Advancement Opportunity

Fifteen women (10.2 percent) stated their greatest gender-related surprise was the promotion opportunities available to women in the transportation/logistics industry.

> Because I'm a woman in a male-dominated industry, I'm different. People pay attention when I speak, and people know who I am. It's nice.

> Companies now want to advance women into logistics management to even out the ratios. I have been in two key management roles (partly due to gender, I believe) in the last 2-1/2 years.

> Because I'm unique, people listen more when I speak. Top management at my company is very committed to gender equality, and the opportunities for women in logistics have never been better.

> Many men do value and respect gender differences, and they seek out the female perspective. I now believe it is a great advantage to be a women in such a male-dominated industry as logistics.

Extent of *Old-Boy* Network

The fourth most common gender-based surprise was the extent of the *old-boy* network in the transportation/logistics industry. This problem was noted by 14 female respondents (9.6 percent).

> That an *old-boy* network really does exist. I started working in a high-tech aspect of the economy where what was respected was what you knew, not your gender. I have been shocked to find I have been left out of meetings and other projects because I am a woman. hence, an *outsider* in this male-dominated aspect of business."

> There are men at the top in logistics, and they hire and promote managers who are like them. There really is a *boys club* at my company, and only men need apply if you desire promotions.

> It is so hard to get your abilities noticed. Why? Because men favor men, and hence, men get the high-profile extra assignments that I am excluded from. Therefore, men are promoted much more frequently, because they have had the opportunity to perform in high-visibility projects.

Excluded From Socialization

Ten female respondents (6.9 percent) stated their greatest gender-related surprise was the extent they were excluded from socialization in the work environment.

> How left out and isolated I feel at meetings. People listen when I speak, but at breaks, no one talks to me. It is like I'm not really there and they wish I weren't there.

> Being excluded from social activities. Unless wives are invited, I rarely get invited to go out for drinks after work, for example.

> I work in a male-dominated workplace. In my company, men seem ill at ease around women, so I am not asked to go to lunch with my coworkers. I feel very isolated from other managers. Work in this environment is not fun.

Women Are Better Managers

When asked about their greatest gender-related surprise, ten women (6.9 percent) stated that women are better managers than their male counterparts.

> I've managed to outperform more than three-fourths of my male counterparts, partly because females tend to be more organized and more meticulous in keeping track of details and more productive in sales calls due to maternal instincts. We have a need to *take care* of our customers, and we work harder to do so.

> I feel I can assess people and situations better than my male colleagues. Call it female intuition.

> Because women have a more nurturing manner, both men and women *open up* more with women, and I really get to know my employees better. Since I really know each worker's strengths and weaknesses, I can better assign subordinates to positions that use their strengths or help them to develop in areas where they need to improve.

Extent of Sexist Behavior

The last gender-based surprise, noted with any frequency, was the extent of sexist behavior that takes place in the work environment. This problem was stated by six women (4.1 percent).

> The amount of outright sexist behavior and comments made by male colleagues in the presence of professional females.

> I am amazed professional men will tell such crude jokes, of which women are frequently the object of the attempt at humor. Generally, women are portrayed as lazy, dumb, or trying to sleep their way to promotions. My greatest surprise is that these alleged jokes are told in my presence.

Table 1 summarizes the greatest gender-related career surprises noted by our female logistics managers. It was a disappointment that more than one-third of the survey respondents declared their greatest frustration was the lack of respect from their supervisors. While this finding was disconcerting, the next two most common responses indicated women did not feel they were discriminated against, and more than 10 percent stated their greatest surprise was the extent of their career advancement opportunities.

Response	Percentage of Total
Women not respected as professionals.	37.0
No discrimination.	17.8
Great advancement opportunity.	10.2
Extent of *old-boy* network.	9.6
Excluded from socialization.	6.9
Women are better managers.	6.9
Extent of sexist behavior.	4.1
Miscellaneous.	7.5

Table 1. Greatest Gender-Related Career Surprise

Additional problem areas included the extent of the *old-boy* network, women's exclusion from socialization opportunities, and the extent of the sexist behavior in the work environment. On balance, women reported more negative gender-related issues than positive ones.

How Men Should Manage Women

The second question asked the female respondents, "If you could tell a male supervisor *one* thought about managing a female subordinate, what would it be?" The response to this question can be categorized into five general categories or themes. (There were six responses—4.1 percent of the total—that were either left blank, or the respondent's answer was so unique we categorized it as *miscellaneous*.) Each of the five general themes will be examined in the descending order of frequency that they appeared. Again, representative comments are included.

Treat Women As Professionals, Not As Women

By far the most common response to the issue of supervising a female manager was to treat her as a professional, not as a woman. The idea that women should receive exactly the same treatment as men was stated by 62 female respondents or 42.5 percent of the survey participants.

> Treat her equally, and she will be able to learn the ropes by watching her fellow workers. Special treatment, whether positive or negative, makes it difficult for her to earn the respect of her peers.

> Treat a woman exactly as you would a man. Gender shouldn't enter into how one person treats another. Treat everyone as you would want to be treated.

> Don't patronize us. Treat us as equals. That's all we ask.

> Manage her exactly as you would any male: give her equal challenges, coaching, and opportunity.

> Treat all subordinates equally; respect people for their knowledge and contributions and don't be patronizing or condescending.

> Forget gender! If a gender neutral environment can be established in the workplace, a professional attitude prevails.

> Treat women as you do men. Do not look at them differently because of gender. Treat them as you would have others treat your own daughter.

Respect Women's Differences

Thirty women (20.5 percent) stated their best advice to males who supervise females is to remember that women are different than me—not better, just different. They noted that women are more emotional than men, and male supervisors need to understand this difference. They also noted that women managers like to discuss issues more than men do, and they need to receive more verbal recognition than their male counterparts.

> Women work very hard and need verbal recognition more than men do. A kind word goes a long way.

> We are more emotional than men. Logic sometimes is less important to us than men; we depend more on intuition and emotions. We need to receive recognition and respect from our superiors, and we definitely need to feel part of the team.

> Women are more emotional than men. Male supervisors must learn to live with this difference. We need to be talked to more often, we need more recognition than men, and we must be continually reminded when we are reprimanded for making a mistake to not take it so personally.

> Women tend to lack confidence/self-esteem in comparison with male colleagues. Male supervisors must recognize this difference and help their female subordinates.

> Men tend to be loners. Women like to socialize at work more than men do. Neither position is better than the other, but they are different! Men must learn to respect both types of individuals.

Do Not Overmanage Women

The third most common advice to males supervising females is to not overmanage them, because women often approach a problem from a different perspective than a man. Thus, men should not tell women exactly how to solve a problem; just tell them what the problem is and let the female manager express herself in terms of solving the quandary. This idea was stated by 26 respondents (17.8 percent).

> When managing women, look at the accomplishments, not the methods or approach used to get there. Women are more intuitive, social, and nurturing and frequently use these skills to solve difficult problems in ways that would baffle men.

> Women are problem preventers; men are problem solvers. Since the problem doesn't show up in the first place because of women's actions, we get less recognition than men who step in when there is a crisis and solve it. Male managers should talk more to women and find out what they are really doing.

> When managing females, men must take the time to ask female employees their thoughts about problems. Women analyze situations differently than men and generally have unique thoughts and ideas about how to make the logistics function operate more efficiently.

> Women are less linear than men, and generally consider the human aspect of all problems more seriously than men, which is often the key to the problem. Male managers must be open to women's thought processes and be willing to listen and learn from them.

Do Not Assume Families Are More Important Than Careers

Thirteen women (8.9 percent) stated their most important advice to men when supervising females is to not assume women believe their families are more important than their careers. While this may be true in some cases, supervisors should not assume that, since this presumption is generally not made of male subordinates.

> Offer a female the same opportunities you would offer a male. Too often supervisors will assume a woman wouldn't want an opportunity due to kids, husband, and so forth. Let the woman decide for herself. Behavior like this perpetuates the glass ceiling.

> Assign the travel, work, responsibility, and so forth as if you were dealing with males. The likely results will surprise you—the acceptance, dedication, commitment, and so forth are there.

> I am not fragile. Give me the same opportunities to succeed or fail that you would give to male colleagues.

> Don't assume she will work less hours or less effectively because of family obligations.

Be Flexible with Working Mothers

The last advice from women to men, made with any frequency, was to be understanding and flexible with working mothers. Nine female respondents (6.2 percent) noted that male managers must be more flexible when managing women who are also child caregivers at home.

> There is a difference in sensitivity across gender. Men must develop more compassion and empathy for a female employee who is struggling with children, homemaking, spouses in college, caregiving to elderly parents; is a single parent; and so forth. This is especially true if the male supervisor has a wife who does not work outside the family."
> A working mother has more constraints and pressure than most males. *Be flexible*!

> Try to empathize with working moms. We have far more stress on us each day than does a male, especially one who is married with a stay-at-home wife.

Response	Percentage of Total
Treat women as professionals.	42.5
Respect women's differences.	20.5
Do not overmanage women.	17.8
Don't assume families are more important than careers.	8.9
Be flexible with working mothers.	6.2
Miscellaneous.	4.1

Table 2. How Men Should Manage Women

The question of how men should manage female subordinates is summarized in Table 2. As would be expected, substantial differences were found in the answers. By far the most common response was women managers should be treated exactly the same as their male counterparts. However, three of the next four most common answers to this query declared female managers are different than men—not better or worse—just different. These respondents stated male supervisors must become aware of these differences and be accommodating.

It was not surprising the female respondents had such a range of responses, which undoubtedly reflect the work environments they have encountered. This indicates that, while many women reported no gender-related problems, more did so because their work environment is still somewhat hostile to female managers.

Managerial Implications

Three managerial actions emerge from this study. First, male supervisors must treat their female subordinate managers with the respect and dignity all professionals deserve. All logistics managers should attend a 1- or 2-day (or other appropriate) training session to assist supervisors to become more sensitized to a work environment where women will continue to account for a large percentage of the managerial work force. This training session should also address the issue of inappropriate sexist behavior in the workplace.

A second important issue that emerged from this study is the extent women managers perceive they are excluded from both professional and social activities. Female managers believe this exclusion limits their growth opportunities because they are not as well known as their male counterparts. Women managers want the chance to be included in the *old-boy* network and partake in traditionally male-dominated social activities. Sensitizing men to be more inclusive of women in social activities could be a separate training session, or it could be incorporated into the training session discussed above.

The last managerial initiative is the need for each manager—both male and female—to be aware of the professional goals and aspirations of their female subordinates. More than 40 percent of the survey participants indicated they wanted to be treated the same as their male counterparts. However, a larger percentage of female respondents stated women are different than men, and these dissimilarities must be recognized by male supervisors and accommodated, if possible. Once the male supervisor really understands the female subordinate, most or all of the concerns summarized in Table 2 should vanish or, at least, lessen, assuming the supervisor is committed to gender diversity.

Conclusion

The research identified both positive and negative aspects regarding how female logistics managers perceive their work environment. The first step in making the workplace more equitable and accommodating for women managers is to recognize that female managers have expressed a number of gender concerns. This study should encourage logistics managers—both male and female—to begin a dialogue concerning these issues. Once these problems are recognized and examined, fair-minded managers committed to gender diversity will be able to ameliorate, if not solve, these gender-based concerns.

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(Continued on page 42)

Improvements in multinational logistics must harness the full potential of all nations working together toward innovative solutions.

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Multinational Logistics

managing diversity

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The success of future military alliances or coalitions will depend on a degree of cooperation that goes beyond a "division of labor." It will require developing and implementing common doctrine, training, and the ability to operate smoothly as a combined, integrated force, much as the US military services operate jointly today.

—National Defense Panel, 1997

Diversity is a natural occurrence and refers to any mixture of items characterized by differences and similarities.[1] Effective diversity management deals with the differences and similarities simultaneously. Another way of expressing diversity is complexity. Complexity is a function of the number of components involved and the degree of variation.[2] The more diversity, the more complexity.

Multinational logistics is extremely complex. Logistics consists of several complementary functions that must be integrated to support military operations. Airports and seaports must be operated, a distribution network established, supplies ordered, equipment maintained, and on and on. To this complexity, add joint operations, unified interagency coordination, and national government and private voluntary organization involvement. To further compound the complexity, add multinational forces from diverse cultures that require logistics support from an integrated multinational logistics structure.

Multinational logistics is coordinated logistics activity involving two or more countries in support of a multinational force. Such is the situation in the UN peacekeeping operation in Bosnia where a multinational logistics headquarters of 384 people from 14 nations coordinates complex logistics functions and relationships to support 31 troop-contributing nations.

While a holistic approach to coalition warfare involving all military functions is absolutely necessary, the focus here is on the diverse, multinational logistics staff, who bring together a diversity of languages, cultures, logistics experiences, and ways of doing business. Improvements in multinational logistics must harness the full potential of all nations working together toward innovative solutions. Each individual is important as a potential contributor, but it is the responsibility of senior leaders to provide an environment where staff members, in pursuit of mission accomplishment, can reach their full potential.

Benefits of Diversity in Multinational Logistics

Traditionally, logistics in multinational operations has been the national responsibility of each contributing nation. The North Atlantic Treaty Organization (NATO) coordinated many interoperability exercises during the Cold War. However, logistics support was strictly a national responsibility. Each nation manned, armed, fueled, moved, fixed, and sustained its

systems.[3] Outside NATO, American involvement in coalition operations was infrequent and of short duration. Logistics was provided to US forces from nearby ships, airlift, hastily arranged host nation support, or contingency contracts. There seemed little need to change.

Rather than enjoying the Cold War victory, the United States found itself embroiled in numerous regional conflicts and peace operations. In 1991, the Iraqi invasion of Kuwait galvanized the world community, and America assumed leadership of a great coalition of nations. In 1992, the United States embarked on a humanitarian mission to Somalia with 24 other nations. In 1995, Americans went to Bosnia as part of a NATO force to stabilize the Balkans. In response, US national security strategy emphasized *engagement* with other nations to shape a safer international environment.[4] For the military, engagement meant increased military-to-military contacts, combined exercises, and operations with current and prospective allies.[5] The Joint Chiefs saw coalition operations, especially ad hoc coalitions, as the key strategic features in 2010. US policy showed a marked preference for participation in coalition operations to provide political legitimacy and share military and financial burdens.[6]

NATO recognized European security required action beyond member borders. As a result, *Partnership for Peace* created mechanisms for close cooperation with Eastern European militaries. The Combined Joint Task Force concept adopted in 1994 was designed to make NATO capable of external peacekeeping enforcement and humanitarian operations.[7] Forward-minded NATO senior logisticians elaborated on support of multinational formations by making logistics a collective, rather than a national, responsibility. They redefined multinational logistics to cover "the means to logistically support operations other than purely national . . . ."[8] US logisticians also recognized the need for mutual logistics support to gain economy of effort.[9]

The challenges are immense. As a result of sharply reduced defense budgets, all militaries, including the US, have less flexibility and redundancy than they had 10 years ago.[10] The best way to achieve economy of effort is to integrate logistics efforts as closely as possible to avoid costly redundancies in logistics forces, infrastructures, distribution networks, supplies, and so forth. An integrated multinational headquarters is required to coordinate such a complex effort.

A multinational headquarters provides one very important benefit, beyond the obvious one of coordination. Diversity in organizational decision-making groups leads to higher quality solutions to problems.[11] A diverse group of staff officers from many countries have the potential to generate better solutions. They think about complex multinational logistics situations more realistically because of their varied experience and the group dynamic of consistent counterarguments from different points of view. Differing points of view are further enhanced by the ability of diverse staff members to interact with individuals from their own country or logistics discipline outside the headquarters and bring those concerns and ideas into the group. Networking expands the creative base for decision making and enhances the coordination needed for enacting solutions.

An example of such a multinational logistics headquarters was the Implementation Force (IFOR) Commander for Support (C-SPT) staff located in Zagreb, Croatia. Responsibilities included coordinating sustainment, movement, medical, engineering, and contracting for each participating country's national support element.

The C-SPT successfully functioned as a coordination activity. For example, it significantly reduced ration and fuel costs through consolidated contracting and distribution. Ration costs fell from $6.03 per man per day under the previous UN system to $5.89 under IFOR. Fuel costs dropped from 45 cents to 26 cents per liter.[12] The C-SPT established various functional coordination centers such as the Joint Logistics Operations Center, Joint Movement Control Center, and Theater Contracting Coordination Center.[13]

The C-SPT staff was a multinational theater logistics headquarters of 384 people from 14 nations. The commander was a US Army major general with a British Royal Air Force (RAF) air commodore (O-7) as deputy. Coalition officers held several key leadership positions, although US officers from the various Services were in the majority.[14]

All nations predominantly used national logistics support. The Allied Command Europe Rapid Reaction Corps' three multinational divisions (MND)—British, French, and US—established national support elements (NSE) in Split and Ploce, Croatia, and Kaposvar, Hungary, respectively.[15] Other nations embedded within the multinational divisions also established NSEs. Within the US-led MND-North, the NordPol Brigade—consisting of Danish, Finish, Norwegian, Swedish, and Polish units—established a national support group in Pecs, Hungary.[16] The Turkish Brigade set up their NSE in Split.[17]

The MND-led nations coordinated support for multinational units in their sectors. For the US MND-North, acquisition cross-service agreements (ACSA), established at the national level with implementing arrangements (IA) at the operational level, provided reimbursable support between nations. An ACSA is a bilateral agreement that allows for mutual support through cash reimbursement, even exchange, or replacement in kind.[18] The C-SPT headquarters successfully lashed theater support together by leveraging diversity.

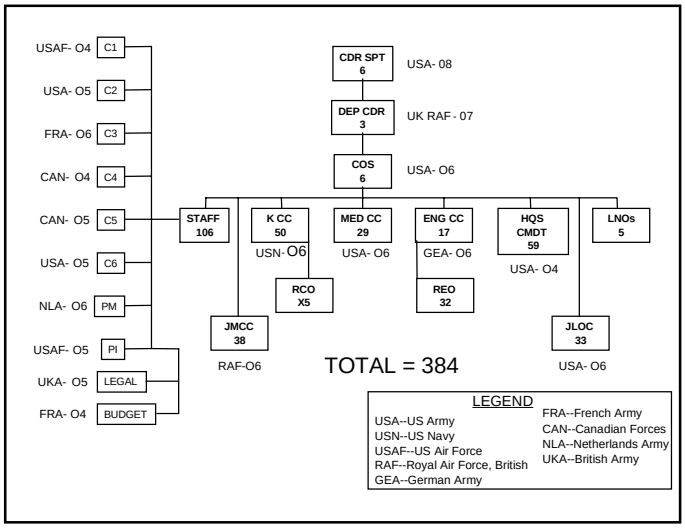

Figure 1. IFOR Commander for Support Staff

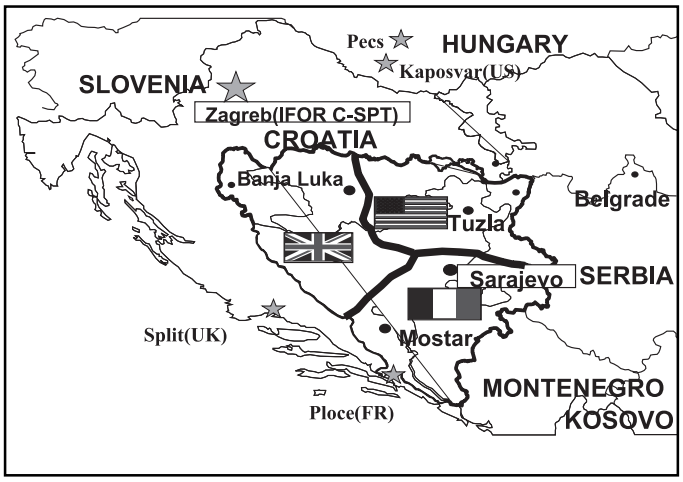

Figure 2. Multinational Division Sectors

Diversity Management Concepts and Process

Diversity should be understood as the varied perspectives and approaches members of different identity groups bring to the workplace. A diverse work force may improve the organization by challenging basic assumptions and thinking of innovative ways to redesign processes, reach goals, frame tasks, create effective teams, communicate ideas, and lead.[19]

In industry today, diversity management is a comprehensive managerial process for developing an environment that allows people to reach their full potential in pursuit of organizational goals.[20] The challenge is to tap the potential of all employees. It is a prerequisite for empowering people in the context of total quality management.[21] Diversity management provides the organizational freedom for diverse people to be innovative.

Diversity must be managed at three levels simultaneously: individual, interpersonal, and organizational. However, traditionally, the focus has been on individual and interpersonal.[22] Techniques have included sensitivity training and using encounter groups to examine individual prejudices and develop an understanding of diverse identity groups. Rules of behavior have evolved such as a variant of the Golden Rule—the Rainbow Rule, *treat others the way they would have us treat them.*[23] The Rainbow Rule requires not only consideration and respect for others but also an understanding of how someone in a different group would want to be treated. What is new in managing diversity is the focus on organizational change.[24]

According to R. Roosevelt Thomas, Jr, a leading diversity management spokesman, diversity management arose out of three trends in American business:

- The global marketplace became intensely competitive.
- The US work force began changing dramatically, becoming more diverse.
- Individuals began to increasingly celebrate their differences and were less willing to assimilate into a corporate culture.[25]

The catalyst seems to be the realization by corporate America that white males were no longer the work-force majority. In 1985, they composed only 49 percent. A 1987 Hudson Institute study projected that, by the year 2000, minorities, women, and immigrants will compose 85 percent of the people entering the work force.[26] With the predictions of future labor shortages, many businesses saw a need to embrace work-force diversity as a matter of survival. Businesses have approached diversity from three perspectives: affirmative action, valuing differences, and diversity management.

Affirmative action is the most widely known approach to diversity. It is based on correcting the negative imbalance of minorities and women in the workplace through the use of goals, with a focus on minority recruitment and retention.[27] Affirmative action also includes the idea of nondiscriminatory and equal treatment to foster a color-blind, gender-blind system. The results are mixed. Although affirmative action forced diversity into the workplace, minorities and women basically remained at the bottom of the hierarchy. While color and gender blindness provided equal treatment, it was based upon a *we-are-all-the-same* assumption that ultimately is blind to the aspects of diversity that are important.[28]

Valuing differences is a derivative of affirmative action. While affirmative action assumes social injustices are a result of hate and prejudice, valuing differences suggests the problem is a lack of awareness and understanding. The focus is on fostering acceptance of individual differences by helping people understand their attitudes toward people who are different. The idea is to modify behavior by educating, promoting acceptance, and respecting differences.[29] While results are positive, one unintended consequence is the propensity to leverage diversity by pigeonholing people based on their ability to gain competitive advantage within their identity group.[30] The black salesman's target market becomes and remains the black community. He is valued for his abilities but is limited to opportunities for promotion and broadening within the black market.

Diversity management encompasses the two previous approaches and adds an organizational perspective. Diversity management examines organizational culture, systems, policies, and processes that enable the organization to work for everybody. The emphasis is on changing the organization. The major difference over other approaches is the leadership and management focus that goes beyond race and gender to encompass all people, including white males.[31] It is not an equality issue. It is a competitive advantage issue. It recognizes that employees frequently make decisions and choices at work that draw upon the richness of their diverse backgrounds. Diversity management attempts to create an environment where diverse perspectives can lead to creative ideas, new ways of framing problems, and innovative processes.

Diversity management creates a climate of balance. Traditionally, businesses' approach to diversity has been assimilation.[32] New employees were expected to adapt to the values, rules, and policies, in short, the culture of the company. However, minorities are less inclined to abandon their minority culture in favor of the organizational culture.[33] They find themselves caught between two worlds and uncomfortable in both.[34] Diversity management balances the individual's need to align the organizational culture with the organization's need to recognize the differences that lead to success.[35]

Changing the root culture of an organization is at the heart of managing diversity. Organizational culture is composed of universally shared values, beliefs, and assumptions that define and drive the organization. It is based upon learned experiences that have resulted in success.[36] The roots are the assumptions upon which the culture rests.[37] The roots must be changed in order for the organization to experience meaningful, lasting change of the systems, policies, processes, and so forth. Identifying which roots enhance or inhibit diversity management is essential.

Thomas outlines the diversity management methodology for changing organizational culture as:

- Examining corporate culture.
- Identifying cultural elements that are fundamental, the roots from which corporate behavior springs.
- Determining whether the roots support or hinder the aspirations of diversity management.
- Changing the cultural roots that are hindrances.[38]

This cultural change component of diversity management is a strategic approach. It requires looking beyond current business successes and embarking on a course of organizational turmoil that may lead to greater success in the future. Since cultures develop over long periods of time and are well entrenched, changing an organization's culture is not for the faint of heart. Change of this sort takes strategic leadership, vision, and a long-term plan.

To deal with immediate concerns, a more operational approach that can be applied in a multinational headquarters is the diversity management process.[39] This process has four steps, with the final step containing a diversity paradigm with eight action options that can be employed to manage diversity.

Step 1, Get Clear on the Problem. Understand what you see and project its implications into the future. What is the environment of the operation? What is required for success in meeting mission requirements? What is interfering with success?

Step 2, Analyze the Diversity Mixture. Understand the situation in terms of the diversity you are dealing with. How many diverse components exist? What are the differences? What are the similarities?

Step 3, Check for Diversity Tension. Diversity tension refers to the conflict, stress, and strain associated with the interaction of the diversity mixture. Is the tension a result of the diversity mixture? If so, should something be done about it? The last question implies not all tension is undesirable. Some tension may be good as it may bring forth minority viewpoints that refine the rough edges of a group's thought process. If the tension is dysfunctional, action is required.

Step 4, Review Action Options. Review the eight action options of the diversity paradigm and choose the options that may solve the problem (Table 1).

Option 1, Include/Exclude. This option involves the decision to include or exclude components of a diversity mixture. An example would be to include representatives from each participating nation in the Joint Movement Control Center or to limit representation to only those nations with transportation forces. The first choice is inclusive while the latter would be exclusive.

Option 2, Deny. This involves the denial of differences. An example would be a logistics operation center (LOC) with officers from four nations being told each officer is expected to coordinate equally well with foreign liaison officers. This denies that a French LOC officer may be able to coordinate more effectively with a fellow countrymen than an officer from Pakistan.

Option	Description
Include/Exclude	Include by expanding the number and variability of mixture components. Or exclude by minimizing the number and variability of mixture components.
Deny	Minimize mixture diversity by explaining it away.
Assimilate	Minimize mixture diversity by insisting the *minority* components conform to the norms of the dominant factor.
Suppress	Minimize mixture diversity by removing it from your consciousness and assigning it to the subconscious.
Isolate	Address diversity by including and setting *different* mixture components off to the side.
Tolerate	Address diversity by fostering a room-for-all attitude, albeit with limited superficial interactions among the mixture components.
Build Relationships	Address diversity by fostering quality relationships characterized by acceptance and understanding among the components.
Foster Mutual Adaptation	Address diversity by fostering mutual adaptation in which all components change somewhat for the sake of achieving common objectives.

Table 1. Diversity Action Options

Option 3, Assimilate. The premise is everyone will learn to become like the dominant element. For example, as the lead nation, the United States organizes a predominantly American multinational logistics headquarters. The Americans decide to use American procedures for all logistics actions and expect other nations to learn and follow.

Option 4, Suppress. Differences are recognized and acknowledged but not allowed to be expressed. For example, because Americans are not familiar with foreign ranks, an RAF officer is asked to refer to his rank as *major* rather than *squadron leader*.

Option 5, Isolate. In this option, a different group is ostracized, and interaction with the dominant group is limited. An example would be the Desert Shield deployment of French forces into Saudi Arabia where they operated independently, receiving French national support through the Red Sea port of Yanbu. American logistics arrived primarily through the Persian Gulf ports of Ad Dammam and Al Jubayl. At the tactical level, logistics units were collocated with XVIII Airborne Corps logistics units. The United States established water and fuel supply points from which the French could draw and transport to their division support area.[40]

Option 6, Tolerate. Differences are acknowledged and included, but no value is placed on the differences. In this option, there is no emotional or intellectual connection with the difference. This is typified by an attitude of, "We achieved success despite the side trips and obstacles put in our path by well-meaning foreign officers."

Option 7, Build Relationships. In this option, efforts are made to foster personal relationships. The goal is to improve understanding and communications through familiarity of the differences and similarities. At a minimum, familiarity leads to more efficient team activity and cooperation. Ultimately, friendship will lead to greater

team cohesion. An example would be the close billeting of key multinational officers together in Yugoslavia in 1994. The UN Head of Mission, Force Commander, and key officers from India and Sweden were housed within 40 meters of each other. They developed close cooperation and could easily talk with each other three to four times a day, apart from formal coordination.[41]

Option 8, Foster Mutual Adaptation. In this alternative, all parties understand that everyone will have to adapt to fully accommodate the entire diversity mixture. An example would be the deployment of the Bosnia Implementation Force. The 32-nation deployment, half of them NATO, was centrally controlled by the Allied Mobility Coordination Center in Mons, Belgium. The detailed multinational deployment plan was integrated into the Allied Deployment and Movement System (ADAMS) computer system. ADAMS interfaces with the automated deployment systems of NATO members; however, non-NATO members used other methods such as charts, diagrams, telephones, and even pencil and paper to communicate their deployment information for input into ADAMS.[42] NATO officers adapted ADAMS to accommodate different inputs while non-NATO officers adapted to a NATO deployment control system.

Application to Multinational Logistics

The more pragmatic operational leader will focus on here-and-now, situational change. The senior strategic leader must focus on cultural change that will enhance future ability to operate in a multinational environment.

Strategic Diversity Management

Changing US military root culture to include cooperative multinational logistics should be similar to how cultural changes happen in the business world. Affirmative action and *valuing differences* programs must occur as parallel activities to diversity management efforts. They signal the impending change, mentally prepare people for multinational contact, and provide insight into the changes needed.

Affirmative Action, Multinational Style. The United States should insist upon coalition representation throughout theater logistics organizations. Moreover, coalition senior officers should hold key positions. The joint practice of assigning an officer of one Service as the leader with an officer of another Service as the deputy could be adopted for multinational organizations. Even if coalition partners do not provide logistics forces to the operation, their interests, ideas, and potential contributions should not be discounted. Canadian forces provided very little theater logistics capability in Bosnia but held key positions as the directors of operations and logistics on the IFOR C-SPT staff.[43] Proportionate representation would establish multinationalism as the norm and place coalition partners in a situation where cooperative decision making is required for success.

Valuing Differences. The affirmative action approach ensures multinational contact, but more important is the quality of the contact. The United States should embark on a *valuing differences* program geared to the multinational environment. We must encourage awareness and respect for diverse cultures.

It seems strange to Americans that in some cultures—such as German, French, Greek and Italian—arguing is a sign of closeness.[44] The underlying cultural belief is, "If we can disagree with each other openly, then we must have a strong relationship and be good friends." The apparent contentious disposition of an officer from one of these countries may be a manifestation that the staff is coming together.

It seems equally strange that in the Japanese culture confrontation in a group is avoided while one-on-one contact is valued.[45] Japanese officers seem to agree with group decisions while actually disagreeing. A Japanese officer may not disagree with an American in a group out of concern the American would be humiliated by the disagreement and *lose face*. Disagreement should be displayed in private to avoid public embarrassment. Therefore, disagreements are expressed in one-on-one contact. Many Japanese view the American propensity to send memos and e-mail as a way of avoiding personal contact and personal insult.[46]

One can readily see that misunderstandings between people of different cultures can easily occur. Learning about appropriate behavior and underlying values in other cultures can help military members avoid the pitfalls.

The *Rainbow Rule* presented previously should be understood and used by US military members to ensure quality contact. Major General William Nash, former commander of the IFOR Multinational Division (North), believed the success of his multinational force was based upon treating each other with dignity and respect.[47]

Diversity Management. A cultural audit forms the foundation of the diversity management action plan. To provide an objective analysis, an outside consultant is usually employed. The intent is to identify and assess aspects of the organization's root culture that contribute or hinder diversity management. A major task is separating business practices and traditions essential for success from personal preference.[48] Awareness of the difference can focus efforts on root values that must be retained, discarded, or modified, while a cultural audit of American logistics organizations would be exhaustive. However, some observations are offered. It is important to understand our own culture and how it influences our behavior and attitudes in a multinational environment.[49]

In *The Argument Culture*, Deborah Tannen suggests Americans think in combative, bipolar terms. There are winners; therefore, there must be losers. If someone is right, then everyone else must be wrong. We manifest this polarization of thought in our conversations and writings by using metaphors relating to battle and sports; for example, "take a shot at it" or "that's half the battle." Rankings and ratings are another manifestation of winners and losers. If there is a point of view on an issue, then Americans must find the opposing view. Tannen says Americans have developed a self-destructive culture of argument, confrontation, and aggressive behavior.[50]

Our pioneer heritage is manifested in American logistics as self-reliance. While an admirable trait, this may lead to a view of multinational logistics as a distracter and drain of US resources. Self-reliance may be at the root of US law that only permits international transfer of logistics on a reimbursable basis. This root value should be modified to accept the paradigm of logistics as a collective responsibility. Acknowledgment of collective logistics responsibility in multinational operations, at the root cultural level, is the foundation for cooperation.

Americans believe they possess great leadership ability. This arrogance is typified by witticism such as "Truth, Justice, and

the American Way." This plays in the multinational arena, as Americans believe they are always right. This is further demonstrated in national security statements that suggest if the United States relinquishes leadership the world would become an even more dangerous place.[51] In fact, US law does not allow Americans to be led by foreign officers except in unusual and temporary situations.[52] Insisting upon leadership in all cases is hardly conducive to coalition partnerships.

Americans are extremely competitive, which translates into a military that values overachievers. Long hours, result orientation, deadlines, and the "I work better under pressure" mentality predominate. Americans are put off by cultures that do not adhere to strict schedules and priorities. Americans tend to think accomplishing tasks is more important than relationships.[53] This results in excluding some nations from planning efforts, over classification of plans and correspondence to exclude foreign disclosure, and relegating some national forces to minor missions. Obviously, these practices do little to propagate a climate of trust.

Changing cultural roots is not a simple matter. Diversity management takes strategic leadership to effect long-term cultural change. Roots run deep and manifest themselves in a myriad of forms throughout an organization. Some potential areas for change follow.

Constraining laws and policies that impede expeditious transfers of logistics could be altered. Transfer decisions currently held at high levels are inherently slow and bureaucratic and sometimes fail to match requirements. The maze of transfer programs—such as bilateral ACSAs, Foreign Military Sales, Presidential Drawdown, Excess Articles, Defense Cooperative Arrangements, and so forth—provides unequal levels of support to different nations and is much too cumbersome, especially in crisis action. The system must be simplified, understandable, and explainable to coalition partners.

Multinational logistics doctrine should be written to engender understanding. It should be reviewed by multinational partners, as was done when the British Army commented on Field Manual 100-8, *Multinational Operations*. As experience in multinational logistics increases, specific publications should be replaced in favor of multinational logistics embedded in all doctrine. For example, joint reception, staging, onward movement, and integration doctrine could address competing multinational requirements for air/seaports, lines of communication, and combined movement control.

System designs must guard against creating too wide a technology gap between coalition partners. Joint systems such as Joint Total Asset Visibility with associated automated interrogation technology should incorporate interfaces with foreign systems. Even Service supply systems could be redesigned to be multinational friendly.

The true environment of operational theater logistics is multinational. The Army Theater Support Command concept that provides joint logistics to US forces should also encompass multinational logistics.[54] The IFOR C-SPT and the evolving NATO Multinational Joint Logistics Center could serve as models. Centralized contracting, movement control, and common item support under a multinational logistics headquarters are the standard of the future.[55]

Training must be developed. Joint/Service agencies can develop multinational compatible logistics processes, integrated information systems, and control mechanisms. But it will be ingenious people at the tactical level will who will iron out the kinks and forge bonds of multinational cooperation. To do this, multinational logistics must be taught as a core competency in skill-qualifying courses. All must learn, train, and perform in a multinenvironment so that it becomes commonplace. Armed with familiarity in multinational logistics, people will make it work.

Operational Diversity Management

Application of the diversity management process and paradigm is at the heart of operational approach. A key decision is whether there is counterproductive diversity tension present and, if so, which of the eight options should be employed.

Include/Exclude. Increasing diversity in a group can positively affect the quality of decisions. However, in the short term, diversity contributes to discomfort and dissatisfaction among members, resulting in less commitment to the group. This tendency decreases over time, as the group becomes more familiar.[56] In other words, it takes time for a diverse group to come together before it can yield creative solutions. This has implications for available time for a logistics staff to come together and for personnel rotation policies.

A decision to diversify the staff should also include the senior staff. Excluding diversity at the senior director level can create resentment. The staff can perceive this as a way for the dominant group to retain control and sense that their nation's contribution or abilities are undervalued.

Commanders must judge the degree of diversity desired within their own operational context. However, political requirements may force the decision.

Deny and Suppress. These options are never consciously employed as diversity tension reduction mechanisms. Denial may reduce diversity in the mind of the individual but does nothing to address actual tension. Diversity and tension are still present. Suppression only delays resolution of tension. It may even increase tension, as resentment builds when someone is expected to suppress differences.

Assimilate. Assimilation may be the most viable option for short duration military operations or where one country provides the bulk of forces and/or logistics support. However, short duration operations do not allow time for a great deal of adaptation of processes or procedures. The lead nation may insist that everyone assimilates into its system. Even in longer duration operations, the lead nation may insist on its procedures. It is important that assimilation not go beyond the realm of successful business practices and spill into personal preferences, conveniences, and traditions of the lead nation. Most officers will assimilate that which is successful in mission accomplishment but balk at appeasing perceived idiosyncrasies of another nation.

Isolate. The trap of pigeonholing multinational partners in role specialization functions on a continuing basis should be avoided. For example, placing Irish officers in the Joint Movement Control Center due to Ireland's contribution of a truck company may seem to be a smart move. However, if transportation is the only staff function Irish officers are afforded, their potential contributions in other areas are lost. Role

specialization is useful but should not constrain participation in other areas.

Tolerate. This is cautious acknowledgment and accommodation of differences. The intent is to maintain the dominant structure while allowing for minor deviations. For example, requisitions must be submitted to a supply activity in the format and medium required by the lead nation. However, to ease understanding and format completion, a national requisition may be attached.

Build Relationships. General De Lapresle, the former commander of the Bosnia UN Protection Force, believed his best officers were those that had worked together in a combined French-German brigade. They were better than French or German officers with no previous multinational experience. They dealt better not only with each other but also with other nations due to a predisposition for cultural openness.[57]

Logistics commanders may not have the luxury of picking officers with previous multinational experience, so they will have to enhance relationship building in the organization in order to create cultural openness. Workspace and billeting collocation can set the conditions for relationship development. Regularly scheduled staff meetings up, down, and laterally across the hierarchy can ensure communication and coordination. Social activities such as sports events can encourage contact with different national officers. The commander can also make use of cross-functional teams to control logistics activities or solve problems. An example would be a logistics operations center, a planning group, or functional boards[58] that require expertise in multiple functions and/or national representation. Including liaison officers from different national organizations also enhances the external networking of the headquarters.

Foster Mutual Adaptation. Mutual adaptation begins with highlighting the major similarity that brought different national forces together—a common purpose. People who view themselves as similar to one another are more apt to work well together.[59] Logistics commanders do this by establishing and proselytizing the mission, their vision, and the commander's intent. From this, all will know the *who*, *what*, *when*, and *where* these three elements convey. The *how* of mission accomplishment is left up to them. This establishes an organization that is flexible and may include any national process, procedure, derivative, or new idea that works.

Much depends on the diversity management skills of commanders. They can create an environment that fosters mutual adaptation by diversifying their senior staffs and expect a team approach that places value in diversity. They can establish the expectation of mutual adaptation by written policy and open, personal advocacy. They can establish control mechanisms such as regular staff meetings, functional boards and centers, and facilitators. Facilitators can assist staff functions or individuals with conflict resolution. Facilitators can be similar to Lieutenant General William G. Pagonis' *Ghostbusters* in Desert Storm.[60] Diversity management Ghostbusters would travel throughout the organization to detect and rectify diversity tension.

Conclusion

The future is multinational operations. Even though ad hoc coalitions predominate, invariably the same nations stand with us, along with some new partners. Each crisis can be an opportunity to build stronger relationships, surpassing the previous operation. The place may be different, the faces new, but the military forces, with their ingrained cultures, are the same. The path to greater multinational cooperation lies in institutional change.

Diversity management is a change mechanism for multinational logistics. To be successful, it must be approached holistically as part of the larger effort of coalition warfare. Top leadership must desire the change senough to commit time, resources, and energy. This is the hardest part because US military cultural bias is for unilateral action, while paying politically correct lipservice to coalitions. To have any chance of radically improving multinational logistics, a strong, visionary, senior strategic leader must heroically step forward with a long-term plan to become a change agent. Otherwise, change will be small and only happen peripherally. The radical improvement that will empower each individual in a coalition and create the organizational synergies will require courage.

Diversity management provides a methodology to change the root culture of US military logistics in favor of a more openminded, trusting, and cooperative multinational environment. It also offers insight to operational changes to deal with specific diversity problems. Each nation brings its diversity to form the total mosaic. The question is whether it will be a coherent picture or a *Picasso*. The United States is just one member of a coalition, but change must begin with someone. It can begin with us.

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(Continued on page 42)

Issues 2000

Cultu

ral Change in the organization

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RAPTR addresses a challenge that confronts all of the Services: how to sustain an evolving global mission in an era of constrained resources.

Introduction

The concept of *corporate culture* is firmly implanted in the lexicon of management. Large numbers of books and articles give an array of definitions of culture, focusing variously on beliefs, practices, values, and symbols. A substantial part of this literature debates whether or not culture has an effect on organizational performance.[1] At the core of this confusion is the debate over whether a corporate culture is something the corporation *is* or *has*. Is culture something a company has,

in much the same manner as other intellectual property waiting to be managed, such as patents, trademarks, and proprietary technology? Or is culture something the corporation is, in much the same manner as Margaret Mead's Samoans are a culture? If a corporation has a culture, the executive should make sure its culture is tuned to the corporation's strategic objectives, in a manner similar to the design of its business methods. If a corporation is a culture, then the executive can only adapt to the organization's culture and trim the sails to prevailing winds. The executive cannot command the weather.

In 1996, the Human Effectiveness Directorate of the Air Force Research Laboratory commissioned a team, led by Wayne State University, to develop a tool that would address the organizational and cultural issues in change management, especially as they related to streamlining logistics support processes. The resulting tool, RAPTR (Readiness Assessment and Planning Tool Research), was delivered to the Air Force in October 1998. The entire premise of this tool was that a corporation *has* a culture, which, therefore, can be tuned.

RAPTR addresses a challenge that confronts all of the Services: how to sustain an evolving global mission in an era of constrained resources. These resource constraints are acutely felt in the logistics arena, where more complex systems, accelerated operational tempo, and new business methods (just-in-time, repair-on-demand, Agile Combat Support, and others) require a high level of adaptability from the work force. Numerous change initiatives have attempted to implement these and related business methods with mixed success, falling short, in part, due to what was viewed as *cultural problems* within the groups affected by the change.

RAPTR provides the change manager with tools to address these cultural and related problems through assessment, diagnosis, and the recommendation of both project plans and remedial steps for the specific problems. In doing this, it incorporates years of experience with change management projects, fieldwork examining the Air Force culture, and a distillation of the literature on change management techniques.

RAPTR Objectives

Rapid and disruptive change is becoming a way of life in the Air Force. Declining operational budgets have not been matched by a corresponding ramp-down of mission or readiness requirements. The Air Force is required to do as much, or more, with less.[2] Consistent with numerous trends in government and industry (corporate information management, Vice President Gore's National Performance Review, acquisition reform, business reengineering), the Air Force is meeting this challenge by finding new ways of doing business—new ways of providing and supporting personnel and materiel for the warfighting commands. Streamlined business methods—a reduction in ordering time for repair parts, for example—translate into larger numbers of mission capable aircraft. These initiatives—Integrated Weapon Systems Management, Agile Combat Support, supply chain management, paperless acquisition—require not only the introduction of new technology but also cultural change, from a process orientation to customer orientation, from fixed to flexible work schedules, from asset hiding to asset visibility, from just in case to just in time.

The *as is* of reengineering and change management scenarios within the Air Force are characterized by small teams adapting published methods to local circumstances; ad hoc use of tools; and in some locations, heavy reliance on consultants to guide the change management process. These teams typically work under aggressive schedules with tight deadlines for deliverables; often they have had little previous experience with reengineering. In addition, the teams at disparate locations seldom share information in any meaningful way.

The goal of RAPTR was to provide a multi-echelon, integrated support environment for the parts of the change management scenario that require experience-based insight into organizational characteristics and change management methods. A key phrase in that statement is *experience based*. The Air Force was spending millions of dollars on various change efforts. Unfortunately, the teams involved were often unaware of each other and their respective successes and failures. Many dollars were also being spent on contractors to bring both specific and general skills to bear on the issues that surfaced during change efforts. If a tool could be created that would allow organic change agents to capture lessons from previous projects, it would be very useful in the sense of not having to *reinvent the wheel*.

At the same time, a tool was needed that could serve as an electronic tutor for change agents. A user-friendly tool to help them learn about the major factors that must be considered *before* attempting a change effort would be not only useful but also cost-effective. Using RAPTR from the inception of a change project would also mitigate the costs of false starts in the processes of introducing changes. Through an assessment function, the tool could also point out when a specific skill was needed, and the team could access that skill for the particular task.

The RAPTR project was to produce a front-end, multipurpose, computer-based tool for integrating cultural, strategic, technology, process, and user-readiness issues and previous project experience into change management scenarios. It would provide assessments of these issues, drawing on a knowledge base of data from previous projects and other sources. It was thought an assessment approach provided the optimum balance between local flexibility and a uniform approach across multiple Air Force components. The knowledge generated would be accessible to business reengineering and other change management teams. RAPTR would also provide a means to aid virtually collocated teams to maintain clear communications regarding taskings and tasking issues for all to have access to the necessary components of the tool.

In addition, experience and the literature had demonstrated that cultural resistance to change is a major factor in the success of reengineering efforts. Yet, no tool extant integrates cultural issues with other change management technologies. Such an integration would enable change management teams to anticipate sources of resistance to change, identify, and leverage the change agents within an organization and tailor their strategies to that which is feasible within the culture of the organization.

The RAPTR team attempted to strike a balance between the desiderata of a nonintrusive tool that would provide useful information and insight into a wide variety of contexts. Given the impossibility of meeting all three of the objectives, the strategy selected emphasized:

1. Focusing on air logistics centers (ALC) and aircraft repair facilities (modifies 3).
2. A drill-down approach, with high-level assessment tailoring a more detailed assessment (modifies 1).
3. Maximizing knowledge content and delivery (optimizes 2).

The research team settled on a definition of culture that placed less emphasis on individual traits and more on shared traits of all members within the organization, traits that were reinforced by organizational structure and history. As viewed here, culture is a set of shared sentiments, originating from multiple sources, that guide and influence motivation without actually directing action.[3] When the research team modeled culture, it established 11 variables:

- Work group innovation.
- Internal status alignment.
- Trust.
- Commitment to organization.
- Commitment to people.
- Value given to learning.
- Mentoring.
- Status conferred by technology.
- Organizational values.
- Middle and line management commitment to change.
- Leadership commitment to change.

RAPTR Development

It was determined the specific uses of the RAPTR tool in supporting change management teams would include:

- Initially assessing the situation.
- Training and orienting the reengineering team.
- Scoping the project.
- Managing organizational culture and user-readiness issues.
- Learning from previous projects.
- Capturing lessons learned from the ongoing project.
- Deciding which tools and methods should be used.
- Deciding which tasks and deliverables are appropriate given the objective and scope of a change management project.
- Designing the *to-be* processes and systems.
- Serving as an integrating and communication mechanism for the change team.

RAPTR would accomplish this support with a unique integration of assessment tools, a knowledge base, communication tools, project management tools, and user-interpreted and prescribed presentations.

The RAPTR project had the ambitious goals of packaging expert knowledge about change management into an easily accessible, PC-based tool and supporting change management projects with that knowledge. Although there are many knowledgeable and insightful individuals in the Air Force, to date, their understanding of the methods and mechanisms of change management has not effectively diffused throughout the entire Air Force community.

As the RAPTR concept evolved and the World Wide Web (WWW) exploded, it was decided to build the technical framework around the WWW. Using the terminology that has evolved over the last several years, RAPTR became a project-focused extranet (a collaborative system, using transmission control protocol/Internet protocols and running on the Internet for use across organizational boundaries).

The goals for RAPTR included knowledge-based planning support, knowledge management/document management, methodology support, and workflow management capabilities. Research team investigations uncovered existing systems or commercial products that individually fulfilled many of these requirements. However, none of these systems met all the requirements, resulting in the need for custom development to link together commercial-off-the-shelf (COTS) items (Figure 1).

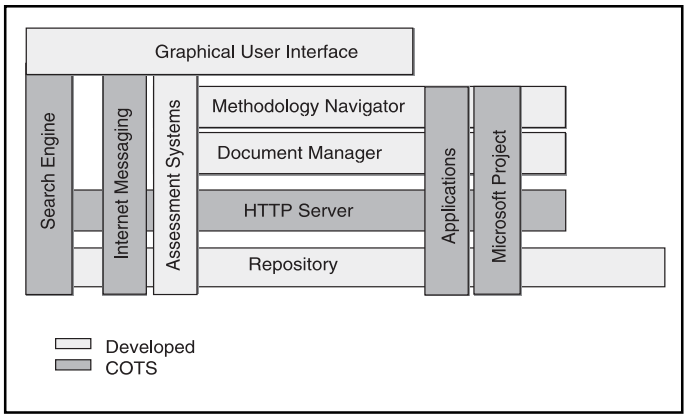

Figure 1. RAPTR COTS and Custom Development Integration

The first task in the project was defining a conceptual architecture for RAPTR that would identify designable components. Setting aside issues of computability and levels of automation, the research team identified 12 components within RAPTR:

- **Reference model of reengineering:** the *backbone* of RAPTR, a compilation of standard reengineering tasks derived from literature and experience. The reference model was also referred to as the *gene pool* of change management, inasmuch as any specific project would draw on some but not all of its elements.
- **Process modeling and characterization:** the ability to create or import process models and add performance attributes such as throughput or process stability.
- **Goals and objectives:** a description and characterization of an organization's objectives in a reengineering scenario.
- **Characterization of the organization:** basic organizational data, including size, complexity, and hierarchy.
- **Technology assessment:** a characterization of the *as-is* technology of the reengineering target.
- **Communication assessment:** a characterization of the communication media and effectiveness within the organization.
- **Cultural assessment:** identifying those aspects of an organization's culture, such as value given to learning, that promote either acceptance of or resistance to change.

- **Project management/workflow manager:** a tool that would identify necessary tasks in a reengineering project and manage the flow of documents through those tasks.
- **To-be process design:** a tool that would provide advice for *to-be* process alternatives based on a characterization of the *as-is* process.
- **Team resources:** methodological tips, templates, guides, and software tools for executing the tasks in the reference model.
- **Designer's notebook:** an evolving project document that assembles both active and completed project documents.
- **Notebook library:** a searchable repository of designer's notebooks from prior projects.

RAPTR Field Trial

Upon completion of the development phase, the RAPTR tool provided project planning and execution support on an Air Force change project. The project selected for the field trial was the Government-wide Purchase Card, which allows use of a debit card for purchases of and payments on commercial items, prior to the project, valued under $2.5K. The project was chartered to expand this usage into other types of items and payment processes. The card is used for making multiple types of purchases, typically from local vendors. An individual who has purchasing authority can purchase small items without going through base supply or requisitioning processes.

RAPTR was designed to facilitate change within an organization, whereas the government card was a process that spanned multiple organizational boundaries. This challenge is an increasingly common one in change management. The project was an effort to expand use of the government card, initially to use it to replace small contracts. This would require new procedures for ordering and receiving materials and for approving invoices and payments. Although these activities span multiple components—potentially including contracting, financial management, materiel management and logistics, as well as the line components that use the materiel—none of these functions or components per se was being changed, only the ordering and payment process.

The team consisted of approximately 25 individuals representing four functions, five locations, and multiple Air Force command levels. Although the majority were from Warner Robins, six team members were from Headquarters Air Force Materiel Command, two from the Office of the Secretary of the Air Force, two from the Defense Finance and Accounting System, and two from the private sector (representing the contracting community and the bank that processes government card payments). This provided an excellent, robust test for RAPTR's ability to integrate multiple locations.

Overall, the field trial resulted in several valuable ideas for improving the RAPTR software, insight into some unanticipated problems, and a better understanding of the requirements for integrating effective project management with project planning and management tools such as RAPTR. In connection with the field trials, the RAPTR team collected data on the users' experiences with the tool. Data were collected by four means: a survey, a focus group, observations of the support engineer, and telephone and e-mail inquiries. These research activities covered a wide spectrum of those who had used or been exposed to the RAPTR tool. Of the respondents, 60 percent (N=12) felt the RAPTR system was useful in achieving their project goals, 50 percent (N=10) felt RAPTR was necessary to do their assigned work, and 80 percent (N=16) felt they understood how to navigate RAPTR fairly well.

Conclusion

The development of RAPTR was based on mainstream change management and reengineering literature, such as, Hammer and Champy,[4] Andrews and Stalick,[5] Davenport,[6] and Kotter.[7] This literature is based on the traditional view of the corporation associated with Chester Barnard[8] and Herbert Simon.[9] The most recent organizational literature has come to view organizations not as determinative entities as in the traditional view but as accidental congeries of strategies, processes, personnel, and infrastructure, subject to some form of leadership.[10] In other words, the traditional, top-down model of leadership, determining the organizational form, is being replaced by a more negotiated view that sees leadership operating within an interpretive context that it can influence but not control.

The RAPTR project was occasioned by the observation that cultural issues often constrained possibilities of change within the Air Force. The findings of the field trial strongly supported this initial observation and also support an elaboration and refinement of this initial hypothesis. Within organizations, one can observe both horizontal and vertical cultures or, perhaps, intragroup and intergroup cultures. The former of these is what is frequently described in the literature as *subcultures*,[11] the cultures of occupational groups, regional groups, generational groups, and subrosa networks (*the good old boys*). The latter consists of shared (even if differentially evaluated) understandings and expectations of intergroup relationships: how authority is to be exercised, the appropriate forms for intergroup relationships, and how open can communication be between subordinates and commanders.

In the field trial at the Warner Robins Air Logistics Center (WR-ALC), different types of cultures were observed and documented: a regional culture that was strongly rooted in the American South, a bureaucratic culture that is typical of government organizations, and a military culture that traces back to the military orders of the middle ages. The first of these can be considered a horizontal culture and the second a vertical culture. The third, the military culture, embraces both, although it contains two caste-like groups, officers and enlisted, each of which has its own culture. In a presentation at WR-ALC, these cultures were described, and it was proposed that their misalignments were a source of organizational underperformance. These findings may be typical of Air Force installations that heavily draw upon the surrounding civilian work force.

Within its mission of supporting the nation's security, the Air Force is fully committed to understanding and molding its organizational culture. This can be seen from the numerous cultural surveys, total quality management initiatives, and other innovations in the personnel arena. Like industry, the Air Force sees culture as an issue in world-class performance. The RAPTR project added to the Air Force's toolkit for collaborative

(Continued on page 43

The Supply Officer of the Future

Major General
James W. Hopp
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Background

The Air Force supply officer career field has much opportunity, if the leaders and the officers in the career field are ready and willing to embrace change. If not, the career field will become redundant and could be eliminated. Why do I say this?

First, the size of the Air Force is down dramatically—from around 600,000 active duty personnel in 1989 to fewer than 400,000 in 2000, a 40 percent reduction in active duty end strength. The Department of Defense budget has declined 28 percent since 1990, procurement spending has decreased by 53 percent, and operations and maintenance has been reduced by 15 percent. While this is not news, the pressure to continue reducing the support side of the equation is continuing and will increase in the years to come. Operations and procurement of new systems appear to have taken all the cuts they can afford.

Second, the way the Air Force will provide support to new weapon systems and, to some extent, existing systems will be significantly different than in the past. C-17 Flexible Sustainment, F-117 Total System Performance Responsibility, and other concepts that provide contractor logistics support are either already in place or will be in the near term.

Third, there is a valid need for an officer corps that can provide what the commercial world refers to as *supply chain* expertise. While this is close to the skills many supply officers have developed, it is not reflected in the way the career field is described or in the training. Some of these changes include major command (MAJCOM) supply regionalization, loss of base service stores and individual equipment sections, increased use of the Government-wide Purchase Card, the Defense Logistics Agency's expanding use of prime and direct vendor delivery contracts, and the evolution of the Expeditionary Aerospace Force concept. The Air Force Deputy Chief of Staff for Installations and Logistics' transformation program will drive even more dramatic changes in the logistics processes.

Fourth, many of today's supply officer functions are similar to, or the same as, those taught in 1963 in the supply officers course at Amarillo AFB, Texas. That may not be bad, but it does not reflect what has happened in the commercial marketplace and what needs to happen in the Air Force.

Finally, there has probably never been a better time to make a change. The Air Force is conducting a logistics transformation program, the Chief of Staff has directed an assessment of the logistics organization and career fields, there are ongoing reengineering initiatives in all logistics career fields, and the MAJCOMs are all looking for more effective and more efficcient processes for logistics support. Industry has shown they can *reinvent* the traditional supply functional experts into *supply chain* managers who have better career paths and contribute more to the operational and financial health of the company. The Air Force needs to do the same thing with its supply officer and other logistics functional career fields.

Commercial Supply Chain Manager Model

Before discussing how to restructure the Air Force supply officer career field (AFSC 21SX), we need to compare it to the typical commercial, supply chain management position and highlight some of the responsibilities of the commercial supply chain managers.

Air Force Manual (AFMAN) 36-2102 describes supply officer duties and responsibilities as:

> Directs, manages, and operates supply, equipment, and fuels management systems; develops, formulates, and implements plans, programs, and policies to operate, manage, and administer current and projected supply and fuels management systems; requirements determination and computation; allowances and authorizations; inventory and distribution control; reporting; stock fund operating programs preparation; and operations operating budget preparation. May serve as an accountable officer.[1]

What are the typical duties involved in supply chain management? Companies tend to differ in how they describe the duties of a *supply chain manager*, but they all generally involve those duties described in this description and the following quote.

> Simply stated, the supply chain encompasses those activities associated

with moving goods from the raw-materials stage to the end user. This includes sourcing and procurement, production scheduling, order processing, inventory management, transportation, warehousing, and customer service. It also embodies the information systems so necessary to monitor these activities.

Successful supply chain management coordinates and integrates these activities into a seamless process. It embraces and links the partners in the chain. In addition to the departments within the organization, these partners include vendors, carriers, third-party companies, and information systems providers.[2]

Further, a description of the logistics professional in supply chain management includes the following quote from *Logistics! Candid Insights for Supply Chain Leaders*.

Today, a successful supply-chain leader serves as a natural facilitator and integrator between the divergent needs of sales and manufacturing, quality and price, cost and service, and financial and qualitative measures.

To assume this kind of quarterback position effectively, however, logistics professionals have to do a couple of things. For one, they must broaden their understanding of other business functions within their organization. Specifically, they need to know more about purchasing and sourcing practices, production planning, marketing initiatives, and sales programs and promotions. They also must develop a more intimate knowledge of the customer, for as the new maxim goes: supply-chain management begins and ends with the customer.[3]

While each company may structure its positions differently or give the job a different title, the responsibilities are similar. The following are three supply chain manager position descriptions.

- **Supply Chain Manager** for a $100M manufacturing company. Provides strategic direction and leadership to the purchasing and inventory groups in all activities related to the selection, procurement, receipt, and management of products and services. The successful candidate will manage inventory levels and develop a strategic materiel/procurement plan that supports the objectives of the organization. Strong involvement with vendor evaluation and relations, negotiating bids, and qualifying the vendor base to support enterprise-wide objectives.
- **Vice President of Operations** for an international paperboard, packaging, and building material company. Responsible for driving key initiatives for the organization. Requires background and hands-on experience in the areas of logistics, transportation, customer service, store operations, forecasting, and all supporting information systems. Additional responsibilities include leading and developing customer-integrated logistics initiatives to improve company services and cost relationship with the customer. Participates in strategy development with a broad consumer/retail customer base. Creates linkage within team and across teams for all logistics, forecasting, and customer service initiatives. Ensures inventory to support both new product availability and promotion activity. Effectively manages all integrated logistics and customer service initiatives.
- **Senior Manager/Associate Partner for Supply Chain Management** for a major consulting firm. Requires strong experience in one or more of the following areas of supply chain optimization: (1) e-procurement, (2) advanced planning systems, (3) e-fulfillment (online order processing/returns), and (4) systems integration (information technology delivery of supply chain systems/implementation—integration).

While there are many similarities in the major supply chain management (SCM) functions in AFMAN 36-2105, the differences are dramatic. The commercial SCM manager has a much broader responsibility for the entire process of determining what is required; purchasing, transporting, storing, and issuing; planning production and repair of an item; and ensuring the customer is properly supported. The Air Force supply officer has no responsibility for acquisition, transportation, or production/repair planning. These functions are performed and directed by different career fields. Yet, the supply officer is the one to whom the wing commander turns to ensure the necessary parts are available to meet sortie requirements.

What Should the *Reinvented* Supply Officer Career Field Look Like?

The supply officer of the 21st century Air Force, with the principal duty of supporting the Aerospace Expeditionary Force (AEF), should be an officer who is trained to perform the traditional functions associated with logistics plans, supply, acquisition (procurement), component repair, and transportation currently performed by five separate career fields. This reinvented career field should be called the *logistics support officer*.

This *logistics support officer* should be the single point of contact for the wing commander, logistics group commander, or operations squadron commander for anything and everything to do with getting parts or logistics services to satisfy mission needs. This person does not have to actually do the work but must ensure it is done. For example, if an operations squadron needs to have a service contract for logistics support of a mission planning system and the inventory manager does not provide the support,

SCM Function	AFSC 21SX	Commercial SCM
Initial Requirements Provisioning (Sourcing)	X	X
Initial Requirements Acquisition	X	X
Initial Requirements Transportation	-	X
Production and Repair Planning	-	X
Transportation Planning	-	X
Long-Term Requirements Planning	X	X
Supply Budget Preparation and Execution	X	X
Replenishment Requirements Determination	X	X
Replenishment Acquisition	-	X
Production and Repair Scheduling	-	X
Order Management	X	X
Inventory/Materiel Management	X	X
Warehousing and Issue	X	X
Customer Service	X	X
Disposal	X	-
Logistics Information Systems	X	X

Table 1. Comparison of Major Supply Chain Management Functions[4]

then the *logistics support officer* should be able to determine what company can provide the best service and direct the award of the contract using e-procurement or other web-enabled techniques.

To illustrate the differences between the commercial supply chain manager's and the military supply officer's responsibilities, consider a few examples.

Acquiring parts or repairs needed on an emergency basis is another case where the logistics support officer should provide the service without having to go though the contracting activity. These steps add time and cost but do not add value. That is why they have been eliminated in industry. If the logistics support officer is the *contracting authority*, the processes will allow this support to be obtained from the fastest and most efficient source available, without the delays that result from having to pass purchase orders from office to office.

In the area of fast transportation, the logistics support officer should also be able to direct the manner and speed of the shipment to and from the base to meet operational needs and budget restrictions. For example, how many of you order from a catalog or from an online web site? You decide at the time of your order if you want to pay for premium transportation or allow the shipper to decide, based on when you need the item. There is no reason in today's e-commerce environment that logistics support officers should not be able to do the same thing.

In the commercial example, the supply chain manager would not have to go through all the *hoops* or prepare all the paperwork that must be generated to do a similar task in the Air Force. The requirements are the same, and the process should be the same. The appropriate checks and balances could be established to meet the requirements of the *Federal Acquisition Regulation* (FAR). Better still, maybe the FAR restrictions should be removed as an acquisition reform initiative to permit a more flexible and effective support process.

So How Do We Create this *Logistics Support* Officer?

First, determine what functions a logistics support officer needs to provide support to the AEF wing commander at both the home station and in the deployed operational environment.

Second, design the technical schools to teach young officers to use their brains and the skills they bring with them into the Air Force. They know how to use the web. Allow them to use sites like *buy.com, myaircraft.com, Exostar.com, aerospan.com,* and others to buy authorized items and services. Laws and regulations must be addressed to ensure correct parts and services are being procured, but this can be done using the Assistant Secretary of the Air Force Acquisition Lightning Bolt process.

Third, define what can and cannot be bought at the local level and what can and cannot be bought without a contracting officer's warrant. There may even be a point where logistics support officers have warrants up to certain levels. The list for what cannot be bought should be fairly short. It should not be used as a way to keep jobs in a career field but should be limited to items and/or services that are safety of flight or engineering critical at the field level or specifically mandated by public law.

Fourth, create a career path that begins with second lieutenants to lieutenant colonels learning the intricacies of the contracting, logistics plans, supply, and transportation fields through both technical schools and field experience. Eliminate stovepipe schools and training paths and create a consolidated career path from the start, creating a multiskilled officer. All career fields multiskill their officers today, and they can handle the complexities of the various logistics disciplines. In this way, when officers are ready for squadron command, they will be better prepared to lead a *consolidated logistics squadron*. This logistics squadron would replace the current supply, transportation, and contracting squadrons and be responsible for supporting all facets of the wing's mission in the logistics functional disciplines.

Conclusion

You may not agree, but at least look at both the positive and negative aspects from the standpoint of what is best for the Air Force and its officers in the 21st century. One of my greatest regrets is that I did not initiate the discussion of more dramatic changes when I was the Director of Supply. I am not sure I could have gotten anyone to listen, but we could have had some interesting discussions.

The Air Force is not a business, and there are a lot of what some call *inefficiencies* in how supply and logistics business is done today, especially in support of the deployed units. Some of these *inefficiencies* are necessary to ensure the support required to respond with little notice to contingency operations. However, I reject the argument that, because the supply officer supports the warfighter, we cannot be more effective and efficient in how we do the job. The idea that we are so different or unique we cannot use commercial models will not wash anymore.

An opportunity exists for Air Forcee supply (and logistics) leaders to be creative in planning how the career field should evolve. If they do not seize the opportunity, the career field will become redundant, and the career path will stagnate and could be eliminated. We owe it to the officers in the supply career field to maintain a viable, effective career path, one that supports the warfighter in the most effective and efficient manner possible. Moreover, the supply officer is uniquely positioned to be the centerpiece to implement the new SCM capabilities to support the AEF. This new career field can be the bridge between planning and execution of the reengineered AEF support patterns.

Now is the time to look creatively at how the current supply officer and other logistics functional officer career fields can be combined to better support the Air Force and provide a better career path for the officers who will follow.

Notes

1. *Air Force Manual* 36-2105, Attachment 6, 11 Mar 98.
2. "What's the Buzz? (Supply Chain Management), Logistics Management, 1 Feb 97, 1.
3. "What's the Buzz?" 5.
4. *Air Force Manual* 36-21105.

General Hopp is a former Director of Supply, Office of the Deputy Chief of Staff for Logistics, Headquarters, United States Air Force.

AFMC Studies and Analyses Program

The Air Force Materiel Command (AFMC) Studies and Analyses Office (SAO/XPS), a field operating agency under AFMC Plans and Programs (XP), conducts and sponsors studies and research of significant materiel issues. The research provides analytical solutions for improved business practices. Efforts focus on the development and enhancement of mathematical models that can relate materiel resource decisions to resultant impacts on business performance and weapon system availability, enabling AFMC to prioritize and justify its investments. The studies and analysis staff works closely with its customers to ensure a healthy balance between the rigorous application of operations research techniques and practical solutions.

The SAO/XPS senior staff consists of:

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Visit the SAO web site to view the 1999 Annual Report: http://www.afmc-mil.wpafb.af.mil/organizations/HQ-AFMC/XP/sao/. A summary of recent studies follows.

Execution and Prioritization of Repair Support System (EXPRESS) Implementation Support is the Air Force depot repair and distribution prioritization system. SAO is the Air Force technical office of primary responsibility for the EXPRESS Prioritization of All Reparable Spares (PARS) math model, which is the primary EXPRESS prioritization mechanism. SAO provided EXPRESS support in a number of ways.

1. **System Development.** This included supporting the development, testing, and implementation of three separate EXPRESS releases:
   - *Version 3.1.* The Air Force Logistics Board of Advisors (BOA) recommended changes to direct support to higher priority units. These were implemented in EXPRESS, but air logistics center (ALC) users questioned their impact. They felt the BOA priorities had unintended consequences that would degrade shop replaceable unit (SRU) support. An analysis confirmed these suspicions, and modifications were developed and approved. Efforts focused on testing these changes in the production system to ensure recommended modifications had the desired effects. Work on EXPRESS metrics demonstrated customer support for SRUs had improved as a result of these changes. The results were briefed to various audiences, including HQ AFMC Logistics (AFMC/LG) and the Air Force Supply Executive Board (AFSEB). This release was implemented at the ALCs in April 1999.
   - *Version 3.2.* ALC users were concerned that long repair time and long flow time items do not receive sufficient repair priority when repair is very constrained. This release contained system changes that, based on a study of alternative methods, provide the best solution for AFMC customers. The release also included significant streamlining of the EXPRESS process, conceived and supported through the PARS model. These changes reduced system run times by several hours, which is significant since each ALC runs EXPRESS each day. This release was implemented at the ALCs in October 1999.
   - *Version 3.3.* At the summer 1999 Corona meeting, the major command (MAJCOM) commanders devised the Spares Priority Release Sequence, which was a *tweak* of the BOA priorities, to provide increased support to project code 700 mission in-capable requisitions and broaden the category of customers who can use that project code. Appropriate changes were made to the PARS model, which was implemented in February 2000.
2. **Demand Forecasting.** Currently, EXPRESS offers three ways to forecast customer demands for parts: (a) historical daily demand rate (DDR), (b) historical demands per flying hour and projected flying hours, and (c) deepest holes. This study determined which forecasts most accurately predict demands.
3. **Improving Support to Engine Items.** The AFMC Propulsion Product Group manager felt engine items were not being supported properly in EXPRESS. The most significant concerns were that EXPRESS did not explicitly recognize war readiness engine (WRE) targets and engine items were not being treated equitably. Working with the Joint Engine Working Group, these concerns were evaluated, and it was determined (a) EXPRESS inherently supports engines to a level beyond their WRE target because it tries to support all parts causing existing and projected holes in engines, and (b) improvements could be made in EXPRESS forecast demands by considering the schedule for engine overhauls at the depot, instead of just looking at historical demands. Work continues with the AFMC Logistics Item Management Division and the development contractor to incorporate these changes.
4. **EXPRESS Metrics.** At the request of the AFSEB, an effort was initiated with AFMC/LGI to capture data that could be used to measure the supply performance of items being managed by EXPRESS. The data have been presented to the AFMC Commander, AFMC/LG, AFSEB, and other Air Force logistics managers. Study results show EXPRESS-managed items are generally healthier than non-EXPRESS-managed items and changes to the EXPRESS logic are having a positive effect on customer support.
5. **EXPRESS Assessment Tool.** SAO developed a tool, based on earlier recomputations, that supports forecasting the impact of changes of weapon systems analysis. The tool was instrumental in completing the long flow study and helping convince Oklahoma City ALC (OC-ALC) management an alternative prioritization scheme gave inferior results to the EXPRESS prioritization approach. **(Analysts: Rich Moore, Captain Michel Lefebvre, Karen Klinger, Lieutenant Jason Vinson, Freddie Riggins)**

Retail and Wholesale Stockage Levels for the Air Force.

The readiness-based leveling system (RBL) integrates retail (base) and wholesale (depot) environments while determining the best base stockage levels and depot working levels to achieve the lowest expected worldwide base back orders. SAO provided technical support in the following areas:

1. **Reviewing the adjusted stock levels (ASL) in RBL for all comm-electronic items.** Under stockage policy, these Air Force Communication Agency (AFCA) items receive certain minimum stockage levels based on a single-point failure code. Currently, ASLs for these items are fed

directly to RBL from the bases via AFCA. In the future, the only source of ASLs will be from AFCA through a direct pass from AFCA to RBL. SAO analyzed the ASLs from both sources, notifying AFCA of any differences. Using the results, AFCA asked the using commands to verify or delete their ASLs. This enables the correct levels of these critical items to be loaded at the bases.

2. **Identifying and providing data to RBL for about 10,000 items not available during normal RBL processing due to system interface issues.** It was able to provide the data, enabling the MAJCOMs to receive the benefits of RBL processing.
3. **Analyzing how RBL handles items with high condemnations.** The investigation revealed RBL logic does not properly treat depot condemnations. A solution is under development.
4. Many of the issues associated with RBL surround the data that it is fed, so SAO initiated a study that looks at the two-way interfaces between RBL and D041. Other data that comes into the system prior to RBL processing will also be examined. **(Analyst: William Morgan)**

PSBA Minimums and Standards Resource Baselines

The AFMC Product Support Business Area (PSBA) needed a method to estimate the minimum and standard budget and manpower requirements to use as input for the program objective memorandum process.

To support this requirement, program data provided by the AFMC Acquisition Support Team, Product Line Division, and DRS, along with manpower data provided by AFMC Manpower and Organization, were used to compute manpower requirements for 23 categories of system program offices (SPO). SAO computed minimum manpower requirements using data from SPOs identified as *benchmark SPOs* or SPOs that operated most efficiently as a result of acquisition reform practices. The remaining program data were used to compute standard manpower requirements. The AFMC Business Area Operations Division used the results to calculate air logistics center resource requirements to use in the POM process. **(Analysts: Thomas Stafford, Rich Moore)**

AFMC Logistics Response Time

This effort involves providing a way for AFMC and the major commands to monitor base supply wait times associated with orders for AFMC-managed items. This facilitates identification of supply chain bottlenecks. Trend analysis may indicate developing problems or improvements.

SAO built the monthly Logistics Response Time (LRT) databases and incorporated new business rules to improve its tool. This system uses data on closed requisitions to monitor wait time by ALC inventory control point, product directorate, weapon system, requisition priority group, item, base, and major command for both recoverable and consumable supply management activity group items. The source of the data is the monthly Logistics Metric Analysis Reporting System (LMARS) files from the Defense Automated Addressing System. A special version of AFMC LRT focuses on Contract Repair Enhancement Program (CREP)/organic/dual repair items. Versions that focus on two-level maintenance items and one that focused on support for the Kosovo crisis were also developed. In addition, SAO worked with the Air Staff to address AFMC LRT and LMARS differences. Trend information, charts, and data are available via a web site: http://www.afmc-mil.wpafb.af.mil/HQ-AFMC/LG/LSO/lot/. Senior AFMC management regularly reviews the results from the tool to monitor AFMC supply chain performance. **(Analysts: Captain Thuan Tran, Mike Niklas, Curt Neumann)**

Wholesale Back Order Targets

The wholesale back order targets study determines the planned number of wholesale back orders inherent in the AFMC requirements computation system; that is, how many back orders can be expected based on the aircraft availability targets supplied by Air Staff and the forecasted pipeline times and demand rates?

Using input data and results from the March 1999 D041 cycle and the October 1999 RBL leveling process, the planned number of wholesale back orders was determined. Planned back orders are a function of the depot pipeline requirement and the amount of stock placed at the depot. According to the requirements process, there are 18,421 planned wholesale back orders for Air Force recoverable items. For consumable items, the planned number is 8,460 back orders. Planned wholesale back orders were compared with actual back orders on an item-by-item basis, and more than 90 percent of the nearly 28,000 active national stock numbers (NSN) were within ten back orders. In other words, the planned and actual back orders differed by less than ten units. On the other end of the spectrum, there were 177 NSNs where the difference was more than 100 units, including 10 items with a difference of more than 1,000 back orders. The total number of actual back orders for this group of 28,000 NSNs was 142,054. A sensitivity analysis revealed the effect of executing the computed stock levels with unanticipated pipeline increases (for example, repair constraints, excessive demand variation). Planned back orders increased significantly when the expected pipelines were doubled or tripled. Results were briefed to AFMC/LG and the Logistics Business Board Tier 2. At the request of AFMC/LG, the planned wholesale back orders by supply chain manager were identified and rolled up to each ALC. The next step is to work with the customer to transform these measures to actual targets that can be used to measure SCM performance. **(Analyst: William Morgan)**

IE/SE Targets

SAO provided a quantitative methodology for determining issue effectiveness (IE) and stockage effectiveness (SE) targets for recoverable items. IE is measured for all items and represents the percent of time a customer receives a part immediately upon request. SE has the same definition as IE but is only measured for items authorized to be stocked.

A method for determining IE/SE objectives for each item using an approach similar to that employed in the Wholesale Back Order Targets project was developed. RBL data, expected pipeline times, and base stock levels from the AFMC requirements system were used to compute the inherent IE/SE values. The command-wide values were 81 percent for IE and 89 percent for SE. SAO also decomposed these into values for each ALC and supply chain manager and briefed the results of the study to AFMC/LG and the Center executive directors at the Logistics Business Board. Work continues with AFMC/LG to refine the values into achievable targets. **(Analyst: Michelle Judson, William Morgan, Rich Moore)**

Excess Awaiting Parts Management

The AFSEB has been concerned about the proliferation of items that are excess awaiting parts (AWP)at base level. The purpose of the study was to first quantify the extent of the problem, then to recommend business rules to reduce it.

In August 1999, SAO briefed the AFSEB to quantify the extent of the problem. Only 15 percent of the AWP that existed at that

time were within the authorized stockage requirement for the base. These items are adequately supported by EXPRESS version 3.1. The remaining 85 percent of the AWP exceeded the bases' authorized stockage requirements. Of these, the vast majority—71 percent—exceeded the total worldwide-authorized stockage requirement.

Working with the Air Force Logistics Management Agency, SAO recommended to the AFSEB business rules intended to mitigate these problems. These recommended rules had the following effects:

- Parts excess to the worldwide level should be returned to the depots for storage.
- Parts not excess worldwide, but excess at a given base, should be redistributed to the bases that need them.

Work also continues with the Standard Systems Group and the D035 system representatives to improve the reporting of AWP to AFMC. **(Analysts: Rich Moore, Captain Michel Lefebvre)**

Supply Chain Operational Performance Evaluator

The Supply Chain Operational Performance Evaluator (SCOPE) is used to address a variety of supply chain issues. The software, formerly the Supply Chain Simulation Model, is a stochastic event simulation that quantifies the impact on weapon system availability due to changes in logistics policies and procedures. SCOPE was used in several studies.

- **BOA Priority Analysis.** SAO analyzed the impact on aircraft availability from applying BOA priorities to JCS-coded units. The BOA priorities allowed the Joint Chief of Staff units to improve their requisition priorities in EXPRESS, resulting in increased spares support. Conclusions were (a) as spares become scarce, EXPRESS with BOA priorities provide more support to JCS-coded bases compared to the non-JCS bases, (b) EXPRESS without BOA priorities always resulted in fewer total not mission capable rate due to supply aircraft, and (c) spares have to be scarce before EXPRESS with BOA priorities has a noticeable impact on JCS units. The information was presented to the AFMC/LG and MAJCOMs as a baseline for understanding the impacts of the Spares Priority Release Sequence.
- **EXPRESS versus the Uniform Materiel Movement and Issue Priority System (UMMIPS).** OC-ALC had developed an alternative to EXPRESS prioritization that relied on UMMIPS priorities. SAO quantified the differences between using availability-based (for example, EXPRESS) and UMMIPS-based business rules for repair and distribution prioritization and found that customer support (as measured by available aircraft, MICAPS, and stockage effectiveness rate) was better when EXPRESS distribution and repair policies were used. Results were briefed to the AFMC/LG and OC-ALC/LG, which directly led to OC-ALC reverting back to EXPRESS for its entire center workload.
- **Spares Priority Release Sequence Analysis.** This is a follow-on project to the BOA priorities analysis that uses a Corona-modified version of the priorities. Analysis continues, using the latest version of SCOPE, which allows the use of actual assets. **(Analyst: Thomas Stafford)**

Requisition Objective Holes Versus Back Orders

MAJCOM and ALC customers have identified a disconnect between the number of outstanding wholesale back orders and the number of requisition objective (RO) holes reported to AFMC. Each of these values can be viewed as a statement of customer needs. They should be similar. HQ AFMC/LG tasked SAO to run a comparison of the two to determine if there was a real disconnect and to quantify the magnitude of the problem.

There was, indeed, a problem. Only 64 percent of the back orders from depot customers could be tied to an RO hole, and only 75 percent of the RO holes from depot customers could be tied to a back order. For base customers, only 77 percent of back orders could be tied to an RO hole, and only 71 percent of the RO holes could be tied to a back order. Looking at specific item/base combinations, more than 95 percent of the differences were within two units. The results were presented to the AFMC/LGI and AFLMA. Potential reasons for the disconnect include data system timing, workload transfers between the depots, and items that are ordered in batches rather than one for one. **(Analysts: Karen Klinger, Captain Michel Lefebvre, Rich Moore)**

CREP Cost-Benefit Analysis

SAO provided a tool to help decide whether to pay for improvements in contract repair responsiveness. The CREP is developing processes to improve contract repair responsiveness. Depot personnel have the responsibility for evaluating cost-benefit ratios associated with asking contractors to shorten their repair cycle times.

SAO enhanced the prototype CREP cost-benefit analysis by converting it to a relational database and adding more information regarding status of the items. This helps contract repair managers gather information that can aid in making decisions affecting the responsiveness of contract repair. If there were a plan to buy additional spare parts, perhaps it would be cheaper to work with the contractor to reduce the repair time, thereby reducing or eliminating the buy requirement. The tool also provides supply indicators to determine the effectiveness of the support currently being provided. **(Analysts: Mike Niklas, Jenny Woodrum, William Morgan)**

WSSP Improvements

The Defense Logistics Agency (DLA) provides cataloging, acquisition, stockage, and distribution support for most Air Force-consumable items. The Air Force Weapon System Support Program (WSSP) is a process to register identification and prioritization data with DLA for consumable Air Force weapon system parts that DLA manages. DLA uses this information to prioritize its acquisition and stockage actions. AFMC Logistics Item Management is the functional manager for the WSSP. Their customers at the ALCs and MAJCOMs report that inaccuracies in WSSP data are impacting the Air Force's ability to perform its flying missions, since these deficiencies can lead to consumable item delivery shortfalls.

A report was developed that documents Air Force and DLA registration and support processes and major problems. It covered many of the high-level requirements for markedly improving the WSSP registration process and looks at ways for implementation. After analyzing alternatives, a recommendation was made to rehost the registration data and several WSSP functions in D200F, an existing data system. The recommendation was approved, and requirements are being refined. **(Analysts: Steve Bankey, Raj Srivastava, Mike Niklas)**

The Program for 2000

Current plans are to continue devoting a major portion of the effort toward implementing new methods for improving the management of materiel spares. This will include methods to determine requirements, allocate resources, execute support actions, and assess impact.

(Continued on page 43)

Theater Air Mobility:

Historical Analysis, Doctrine, and Leadership

MAJOR
TED E. CARTER, JR
USAF

We made this train. Why are we making it so hard to drive?

—Major Ted E. "Gene" Carter, Jr

Introduction

In April 1992, Air Force Chief of Staff General Merrill A. McPeak initiated a major reorganization within the Air Force. When he was finished, the entire air mobility in-theater command and control (C2) structure and organization had changed. The changes mirrored the airlift C2 structure used during World War II, Korea, and Vietnam. These old but new changes were specifically felt in the application of new Air Force and air mobility doctrine as well as in the new air mobility leadership during contingency operations. Gone were the days when a commander of airlift forces (COMALF) exercised command authority over airlift forces.[1] Enter a director of mobility forces (DIRMOBFOR), who is tasked to carry air mobility into the future, armed with *coordination authority* but no command authority.[2]

With the end of the Cold War, national strategy documents and joint publications assert that most military operations today and, especially, those in the future are likely to be military operations other than war (MOOTW) and multiple joint task forces (JTF), or task forces (TF), rather than major theater war (MTW). Because of this, air mobility forces need to return to a centralized command and control structure at the theater air mobility level versus one at the air component commander or joint force air component commander (JFACC) level. Therein lies the problem. Current Air Force and air mobility doctrine establishes C2 with the commander of Air Force forces (COMAFFOR) or JFACC instead of the DIRMOBFOR, who oversees theater air mobility operations. During Operation Allied Force, this lack of C2 at the air mobility level created a coordination nightmare for the DIRMOBFOR before tactical control (TACON) was transferred to the commander of the United States Air Forces in Europe (USAFE), because air mobility coordination was extremely complex with validation/coordination required with numerous commands and organizations. If the national strategy is correct in predicting future operations, the DIRMOBFOR may be in charge of multiple JTFs/TFs. Trying to support these multiple task forces by coordinating each mission may lead to a breakdown in coordination, causing some missions to fail.

One way to prevent the failure of air mobility missions is to move command authority back to the DIRMOBFOR at the theater air mobility level. There should be one commander of all Air Force forces with a commander of air mobility forces, or a commander of airlift and tanker forces (COMATFOR), who reports to the COMAFFOR/JFACC but also exercises C2 over air mobility forces. Since a commander is the only one who has the authority to control forces through either operational control (OPCON) or TACON,[3] the DIRMOBFOR could be replaced by a COMATFOR. Then OPCON/TACON could be transferred directly to the commander, making the operation more flexible. With command authority at the theater air mobility level, the COMATFOR would have authority to efficiently and effectively execute missions because authority would be matched with responsibility.

Historical Foundations

Let it be admitted that the modern technological revolution has confronted us with military problems of unprecedented complexity, problems made all the more difficult because of the social and political turbulence of the age in which we live. But precisely because of these revolutionary developments, let me suggest that you had better study military history, indeed all history, as no generation of military men have studied it before.

—Frank Craven

Rapid global mobility operations require a seamless infrastructure to support conflicts, humanitarian needs, and natural or manmade disasters. To better understand today's air mobility forces infrastructure, one need only look at the history of airlift and examine the

command and control of strategic and theater airlift operations during World War II, Korea, Vietnam, and the Gulf War.[4]

World War II

Transport planes were used by the Air Corps Ferrying Command from 30 May 1941 to 9 March 1942 under the direct command of the Chief of the Air Corps, Major General George H. Brett.[5] As US involvement in World War II kicked off, many of the airlift support missions were not coordinated between Army air transport operations and the Navy, resulting in wasted airframes and missions. Often, two aircraft would fly different cargo from the same location to the same destination when one could have carried both loads.[6]

In March 1942, General Henry H. "Hap" Arnold, the new commander of the Army Air Forces, wanted to centralize air mobility operations and bring some form of order to the situation. To do this, he established the Air Transport Command (ATC) and broke it down into two divisions. The Ferrying Division delivered aircraft and transported personnel, while the Air Transport Division delivered supplies and equipment from the continental United States (CONUS) to the theaters.[7] This type of airlift is known as intertheater—or strategic—airlift because it operates between two theaters. Arnold also wanted to keep theater airlift operations centralized, so he assigned troop carrier units to the air force commander within a theater. This provided a means of transportation for combat troops—both airborne and infantry—and glider units and supported the theater commanders by providing them with dedicated airlift within their theater.[8] This type of airlift is called intratheater—or theater—airlift because it operates within the air force commander's theater. Arnold made command and control of these strategic and theater airlift forces easy. He appointed himself commander of the ATC strategic forces and put the air force theater commanders in charge of the theater airlift forces within their theater. His goal was to centralize command and control.[9]

In March 1944, Headquarters Army Air Forces directed the Army Air Forces Board to analyze airlift operations and ensure their efficiency. The Board concluded that a single commander could best meet the needs for strategic as well as theater airlift operations. The commander for strategic operations would be the Commanding General of the Army Air Forces, and the commander for theater operations would be the theater air force commander who had his own airlift assets and could be augmented as required. By affirming Arnold's in-place infrastructure, the Board cemented the foundation of our current airlift structure.[10]

Post-World War II

In 1948, President Truman issued Executive Order 9877 as part of the postwar reorganization to eliminate duplication between the Services. He ordered naval airlift transport assets and ATC to merge. This order led to the birth of the Military Air Transport Service (MATS). All CONUS-based airlift assets came under the single command of MATS. However, this reorganization did not include theater airlift assets. They remained under the command of the theater commander.[11] Although MATS was established, there was no change in the command and control structure for strategic or theater assets.

The Korean War

The C2 structure for airlift during the Korean War was the same as that during World War II. MATS maintained control, operation, and administrative support of strategic operations by moving personnel, supplies, and equipment from the United States to Japan where theater airlift took over. The theater air force commander was in charge of theater airlift operations. Theater operations eventually fell under the control of the 315th Air Division, commanded by Major General William H. Tunner (Lieutenant General). He felt airlift could perform any mission as long as it was centrally managed and under the command of the theater air commander. After the war, the Far East Air Forces report stated, "The assignment of both the troop carrier and transport tasks to a single airlift commander was successful in that it provided maximum efficiency and effectiveness in the utilization of the theater air force airlift resources."[12] Almost 10 years after the Army Air Forces Board results, the Far East Air Forces report on the Korean War also recommended two separate command structures for strategic and theater forces. MATS would continue conducting strategic operations while theater commanders controlled their own airlift operations within their theater.[13]

Pre-Vietnam War

Defense Secretary Robert S. McNamara, under the emerging *Flexible Response* strategy, examined the command and control of strategic and theater (troop carrier) military airlift. McNamara testified before a special House Subcommittee on National Military Airlift, chaired by Representative Carl Vinson:

> . . . distinctions made between troop carrier and strategic airlift operations, which were based upon aircraft capabilities, would no longer be significant with the acquisition of the C-130Es and C-141s . . . and . . . it might prove entirely feasible to load troops and their equipment in the United States and fly them directly to the battle area overseas, instead of moving them by strategic airlift to an overseas assembly point and then loading them and their equipment on troop carriers . . . . This might require some changes in organization.[14]

McNamara directed a review of the MATS organizational structure. He wanted to examine the effects the new C-130s and C-141s would have on the strategic and theater airlift infrastructure, operations, cost considerations, and the need to support theater commanders. Vinson was also curious because he, too, feared duplication of effort and costs associated with separate strategic and theater airlift command structures. To him, the differences between strategic and theater airlift operations were not well defined. Although the Air Force Chief of Staff, General Curtis E. LeMay, disagreed with McNamara and Vinson, he ordered MATS to develop a plan for the possible implementation of McNamara's proposal, which would place strategic and theater airlift forces under a single command and a single commander.[15] That command became the Military Airlift Command (MAC).

The Vietnam War

In January 1966, MATS was redesigned as MAC and maintained command of all strategic airlift forces. As the Vietnam War began, strategic airlift drew upon doctrine from Air Force Manual (AFM) 1-9, *Theater Airlift Operations*, which underscored that theater airlift forces should remain under the command of the theater commander.[16] As the war progressed, there were some growing pains. For starters, the Pacific Air Forces' 315th managed airlift forces for the Southeast Asia (SEA) theater from Tachikawa, Japan, more than 2,000 miles from the theater. This was a poor arrangement for communications and decentralized command and control of SEA theater airlift forces at that time. To get a better grasp on the SEA theater C2, on 15 October 1966, the 834th Air

Division was established at Tan Son Nhut AB in South Vietnam.[17] The 315th continued to coordinate strategic airlift operations with MAC. The SEA theater requirements grew to a point where the strategic MAC crews staged out of Tan Son Nhut in order to expedite the movement of troops and equipment as close as possible to the front lines. At this point, the conflict between where strategic missions ended and theater missions began complicated the airlift mission. "In MAC's view, the optimum arrangement for airlift activities was single managership."[18] The time had come to integrate the strategic and theater airlift forces under one command and eliminate the complications between strategic and theater operations.

Because of the same airlift characteristics and overlapping missions, it was hard to determine when strategic airlift ended and theater airlift began. As a result, the official Air Force-directed Lindsay report stated, "Duplication and/or overlap of the responsibilities and functions occurred in aerial ports, airlift control elements . . . . In this case, there were two airlift forces with similar capabilities performing within and between an area command."[19] The report recommended that the Air Force combine all airlift assets under one command. Finally, MAC made the recommendation to combine all airlift operations under one command to simplify the C2 process and provide a seamless operation between strategic and theater operations. The need for a separate theater C2 structure within the theater, however, remained in order to manage the strategic and theater missions.

Post-Vietnam War

In addition to the Lindsay report and MAC's recommendation to combine strategic and theater airlift operations, the 1969 Project Corona Harvest reports recommended, "All USAF airlift resources should be consolidated under a single organization for airlift." In July 1974, Secretary of Defense James R. Schlesinger directed the merger of strategic and theater assets under the single command structure of MAC and designated MAC a specified command. "In 1974, Headquarters Air Force designated MAC as the single manager for airlift, and in December 1974, all Air Force strategic and theater airlift resources were consolidated under MAC"[20] to reduce the duplication of effort and costs associated with separate strategic and theater airlift command structures.

The Gulf War

Much like Vietnam, the Gulf War proved the flexibility, versatility, and significance of having strategic and theater airlift forces combined under a single command. As in Vietnam, the strategic operations remained with MAC, but the COMALF, acting on behalf of the MAC commander, *monitored and managed* strategic airlift forces coming into or going out of the theater. MAC delegated OPCON/TACON responsibilities for theater operations to the theater commander in chief (CINC), in this case the Commander in Chief Central Command (CINCCENTCOM). CINCCENTCOM then delegated control to the JFACC, who passed it on to the COMALF. Based on the command authority vested in the COMALF, Brigadier General Frederick N. Buckingham, the first COMALF during the Gulf War and the theater point of contact for all airlift operations, said it best, "Anything that smells or *kinda* looks like airlift, they come directly to you. They don't think about the chain of command." Brigadier General Edwin E. Tenoso (Lieutenant General), the second COMALF, also believed his responsibility was to link with the users to ensure their airlift needs were met. "These Gulf War COMALF experiences reinforced the need for an in-theater airlift commander to justify basing and resources, interface with the strategic airlift system, and ensure the readiness of the airlift force."[21]

Airlift forces must be tailored for the future. One way to prepare for the future is to study the past. The review of the strategic and theater infrastructure from World War II shows the necessity of in-theater airlift command. In 1992, under the direction of the Air Force Chief of Staff, the single command structure created by Schlesinger in 1974 was changed back to separate command structures for strategic and theater airlift. The strategic airlift forces moved back under the newly formed Air Mobility Command, while the theater forces were placed under the COMAFFOR. This drove numerous new challenges and changes.

This historical analysis provides a backdrop on how air mobility command and control was formed during World War II and how it began to change during the Vietnam War. During the Vietnam War, an airlift commander within the theater proved to be a solid link, ensuring the efficient and effective use of airlift. Although under a single command, the theater commander carried over to the Gulf War in the form of a COMALF. The sole purpose of the COMALF was integrating strategic and theater airlift, as well as supporting airlift forces. The April 1992 change reorganized the Air Force and airlift organizational structure. These changes also affect the application of Air Force and air mobility doctrine.

Doctrine

It seems very queer that we invariably entrust the writing of our regulations for the next war to men totally devoid of anything but theoretical knowledge.

—Lieutenant General George S. Patton, Jr

Sir Richard Burton once quoted an old proverb, "Peace is the dream of the wise; war is the history of man."[22] Today's military is one of the tools used by the government to shape the global security environment. However, that shaping is not as much through peace and war as it is through MOOTW. Like the name suggests, MOOTW are operations involving the use of military capabilities in a variety of situations or circumstances that are not considered wartime operations.[23] These operations vary widely from humanitarian assistance and natural disaster response to armed conflict. On one end of the spectrum, Operation Atlas Response delivered humanitarian supplies to flood-ravaged Mozambique. On the other end, during JTF Noble Anvil, the air war portion of Operation Allied Force, US and North Atlantic Treaty Organization forces used airpower to force Slobodan Milosevic to cease aggression in Kosovo. For the first time in history, an armed conflict was conducted exclusively through airpower, with more than 38,000 sorties in 78 days.[24] Both of these operations are considered MOOTW. Today, one cannot pick up a newspaper without reading about the trend of military operations supporting MOOTW rather than MTW. Because of this trend, Air Force and air mobility doctrine must address a number of concerns specific to MOOTW, such as conducting several small-scale contingency operations at the same time, in the same area of responsibility (AOR) or theater, the delegation of C2 (OPCON/TACON) of mobility forces at the theater level, and where the air mobility experts should reside. Do they stay in the air operations center (AOC) if better operational and

communication support and theater expertise are available in the air mobility operations control center (AMOCC)?

Air Force Doctrine

The *National Security Strategy*, *National Military Strategy*, and numerous Joint publications—specifically Joint Pub 3-07, *Joint Doctrine for Military Operations Other Than War*—address the current global and political situation and how US military assets will be used in an MOOTW role rather than an MTW role. For example, the *National Security Strategy for a New Century* states:

> . . . the United States must be prepared to respond to the full range of threats to our interests abroad. Smaller scale contingency operations encompass the full range of military operations short of major theater warfare, including humanitarian assistance, peace operations . . . and reinforcing key allies. These operations will likely . . . require significant commitments over time"[25]

Regarding the full spectrum of crises, the *National Military Strategy* says:

> The United States military will be called upon to respond to crises across the full range of military operations, from humanitarian assistance . . . and . . . smaller scale contingencies. We must also be prepared to conduct several smaller scale contingency operations at the same time . . . . [26]

Joint Pub 3-07 discusses the principles, types, and planning for MOOTW. MOOTW is specifically addressed in Air Force Doctrine Document (AFDD) 2-3, *Military Operations Other Than War*. AFDD 2-3 is a broad discussion of the way to employ aerospace power in a MOOTW environment, and as pointed out in the introduction, "The doctrine discussed herein focuses on the operational level; appropriate tactical doctrine is addressed in other Air Force and joint publications."[27]

The tactical doctrine referred to by AFDD 2-3 for air mobility operations includes AFDD 2, *Organization and Employment of Aerospace Power*, and AFDD 2-6, *Air Mobility Operations*. AFDD 2 outlines the essentials of "organization and employment of Air Force air, space, and information capabilities to accomplish the missions assigned by . . . CINCs."[28] AFDD 2-6 describes "mobility organizations, command relationships, and operational elements to include airlift, air refueling, and air mobility support assets," as well as how those forces should be employed.[29] AFDD 2 and AFDD 2-6 provide excellent guidance in support of a *single* JTF, but they do not address, as AFDD 2-3 alludes to, the *tactical doctrine* of conducting several smaller scale contingencies in the same theater/region at the same time that may be associated with MOOTW. In addition, AFDD 2-6 does not address the complexity of the role of the DIRMOBFOR in support of MOOTW, as was encountered during the many task forces of Operation Allied Force.

Air Mobility Doctrine

After the fall of the Berlin Wall and the end of the Cold War, the US military, particularly the Air Force, was downsized dramatically. In response, McPeak merged control of air refueling forces and airlift forces under the newly created Air Mobility Command (AMC) in 1992. Theater C2 responsibilities for air refueling and airlift fell under the guidance of the newly created DIRMOBFOR. According to AFDD 2-6, the DIRMOBFOR is the "designated coordinating authority for air mobility with all commands and agencies, both *internal* and *external* to the joint force. The DIRMOBFOR is responsible for integrating the *total* air mobility effort"[30] between the AOR and between the global systems and the AOR. In reality, the DIRMOBFOR's predecessor, the COMALF, had always been dual hatted, coordinating both strategic and theater airlift. According to Tenoso, who served as the COMALF during Operation Desert Storm, "The DIRMOBFOR has now become a huge dual role by working both airlift and tanker issues."[31]

Doctrinal Questions and MOOTW

National strategy documents and joint publications indicate that most of today's military operations and those in the future are likely to be MOOTW. Because of this, Air Force doctrine should consider possible scenarios across the full spectrum of conflict rather than focusing on operations supporting a single JTF. Air mobility doctrine needs to address issues such as multiple MOOTW scenarios occurring at the same time and what should happen if these MOOTW are in the same theater but in different AORs not associated with an AOC. This situation actually happened during Operation Allied Force when the DIRMOBFOR, Colonel Robert D. Bishop, Jr (Brigadier General), was working seven different task forces supporting Operation Allied Force that had little relation to JTF Noble Anvil.[32] He was coordinating air mobility issues for the humanitarian relief efforts, JTF Shining Hope, and the deployment of Army helicopters for Task Force Hawk, to name two. This situation brought to light two substantial flaws in current doctrine. How can (or should) the DIRMOBFOR operate out of an AOC that, first, does not have sufficient support, specifically communications support, for the DIRMOBFOR to work the other JTF issues[33] and, second, has no support from the JFACC, whose focus is bombs on target and air refueling support for the fighters in the AOR?[34]

Questions have also surfaced about the feasibility of providing a DIRMOBFOR for each JTF. While there would be no problem with one person having visibility over the JTF, the existence of multiple JTF DIRMOBFORs would cause competition for limited theater airlift resources and would most likely hinder the DIRMOBFOR's efforts to execute centralized command and control over mobility issues.

AFDD 2-6 says the DIRMOBFOR is the tanker expert and should stay in the AOC.[35] Frankly, it is difficult to imagine how Bishop could have followed the AFDD 2-6 guidance and worked refueling issues from the AOC in Vicenza, Italy, when he received the best support for coordinating the seven task force issues out of Ramstein AB, Germany, because he could better utilize the support provided by the AMOCC.

Finally, are there too many tasks assigned to the DIRMOBFOR? In a multiple MOOTW scenario or even an MTW scenario, the DIRMOBFOR could really get bogged down trying to perform the dual role of directing both airlift and tanker operations. Speaking of the current DIRMOBFOR position, Tenoso said:

> I could not possibly have done that job during Desert Storm if I had to worry about tankers. Brigadier General Patrick K. Caruana [Lieutenant General] was responsible for all tankers in theater, and I was responsible for the entire theater airlift. So, you had two brigadier generals with two full-time jobs, and now, supposedly, it is assumed under a single DIRMOBFOR?[36]

Perhaps doctrine should designate a deputy with air refueling expertise so the DIRMOBFOR could *direct* all mobility issues, and the deputy could work air refueling issues and airlift issues from the AOC. Are there other possible options?

Numerous questions have been raised concerning the doctrinal aspect of air mobility operations. Current air mobility

doctrine does not answer many of these questions, and these and other doctrinal issues need to be studied more thoroughly. Because of the increased importance of MOOTW and the potential overburdening of the DIRMOBFOR during an MTW scenario or multiple JTF/TF scenarios, Air Force doctrine writers should reassess air mobility doctrine and the responsibilities of the DIRMOBFOR.

Air Mobility Leadership

An army cannot be administered. It must be led.

—Franz-Joseph Strauss

As discussed earlier, in 1992, the Military Airlift Command became the Air Mobility Command and assumed the air-refueling role, in addition to its traditional airlift role. Basically, MAC's (now AMC's) responsibility expanded and became what is generally considered a *mobility* role versus a pure *airlift* role. McPeak's change in air mobility's role and organizational structuring eliminated the need for an air mobility commander or COMALF equivalent. Because the new theater leadership role had changed to that of a *director or coordinator* versus a commander and airlift and air refueling merged to form a new *mobility* role, AMC and the air staff developed the DIRMOBFOR as the title for the new theater air mobility leadership.[37]

During contingency operations, the joint forces command (JFC) organizes forces to accomplish a specific mission. In organizing the forces, the JFC will normally designate someone to have hands-on control of the air mobility forces. These air mobility forces consist of strategic and theater airlift, air refueling, operational support airlift, and aeromedical evacuation. Because of the United States Transportation Command's (USTRANSCOM) and AMC's global commitment to provide air mobility forces, the DIRMOBFOR must coordinate and integrate theater air mobility requirements with global commitments and provide the JFC with enough theater air mobility forces to allow "rapid and flexible options, allowing military forces to respond to and operate in a wider variety of circumstances and timeframes."[38]

What type of air mobility leadership can best meet this need, and should the leadership role be that of a director or a commander? Table 1 compares how the COMALF and the DIRMOBFOR roles meet the requirements for eight leadership functions. Figure 1 shows the organizational structure of the COMALF prior to the restructuring in 1992, and Figure 2 shows the organizational structure after 1992 and where the DIRMOBFOR fits in.

Function	COMALF	DIRMOBFOR
Command and Control	C2 delegated to COMALF from JFC through JFACC	Reports to JFACC
Authority	C2 of all assigned theater airlift forces	None
Command Relationship	OPCON/TACON	None
Working Location	Tactical air command center (today's AOC)	AOC
Intertheater Airlift	Coordinated with AMC/CC	Coordinated with AMC/CC
Selection Process	Nominated by NAF Designated by AMC/CC Approval by theater CINC	Sourced by Air Force component commander or nominated by AMC/CC
Rank	Brigadier General	Lieutenant Colonel or Colonel

Table 1. COMALF and DIRMOBFOR Leadership Assessment

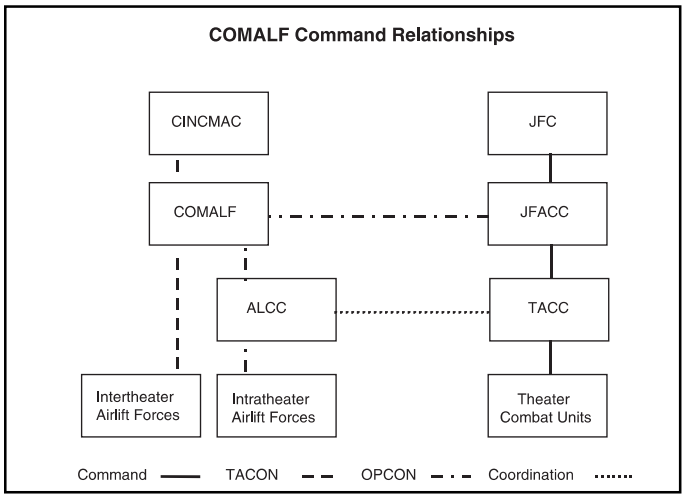

Figure 1. COMALF Command Relationships[40]

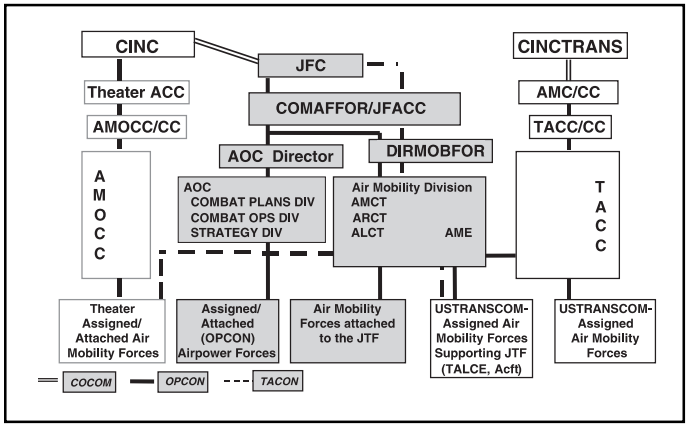

Figure 2. DIRMOBFOR Command Relationships[41]

Prior to 1992, the theater airlift leadership role was performed by a commander, the COMALF, as shown in Figure 1. The COMALF position was developed during the Vietnam War and tested and proven during the Gulf War. Since 1992, the COMALF role has been replaced by a director, the DIRMOBFOR, as shown in Figure 2. The DIRMOBFOR is very much like the COMALF, still coordinating with AMC while supervising strategic forces, and reports to the JFACC.[39] When comparing the basic leadership roles of the COMALF and the DIRMOBFOR, there are also some similarities, but there are aalso some big differences.

The Director Versus the Commander

The biggest difference is the DIRMOBFOR now only has *coordinating* authority.[42] Although responsible for the theater air mobility forces, the DIRMOBFOR is not automatically delegated C2 authority over these forces like a COMALF.[43] For example, Bishop was the DIRMOBFOR in October 1998 when an airlift request was made to support a U-2 mission. As a coordinator and not a commander, Bishop had to coordinate with multiple commands and organizations (for example,

USTRANSCOM, AMC, USAFE, European Command [EUCOM], Tanker Airlift Control Center [TACC], and Air Mobility Control Center [AMCC]) for authority to validate the mission and alert an aircrew to support the mission. As Figure 3 and Table 2 indicate, Bishop made 19 phone calls, starting with the USAFE Crisis Action Team (CAT), to request validation to support the mission. The request went from the USAFE CAT to EUCOM operations and USTRANSCOM before being approved by the TACC at AMC. Once the validation was received, Bishop directed AMCC to alert the aircrew. As a result, the mission was delayed 4 hours, new slot times were required to enter another nation's airspace, and new landing times had to be approved at the destination. The user was dissatisfied, and the host nation did not like the numerous changes it had to make to support the mission. This is one example of the benefit of changing the DIRMOBFOR back to a commander. Before TACON was transferred to the USAFE commander, air mobility coordination was extremely complex because of validation/coordination with numerous commands and organizations. Current Air Force and air mobility doctrine establishes C2 with the COMAFFOR or JFACC instead of the DIRMOBFOR, who oversees theater air mobility operations. There should be one commander of all Air Force forces with a mobility commander, who reports to the COMAFFOR/JFACC but also exercises C2 over air mobility forces. Then OPCON/TACON could be directly transferred, making the operation more flexible. With command authority at the theater air mobility level, the authority will be matched with the responsibility to efficiently and effectively execute missions. As a commander with command authority (OPCON/TACON), the DIRMOBFOR could have taken care of the U-2 mission request with two phone calls. The first call should have been to EUCOM to get verbal validation, and the second should have been to the AMCC directing that it alert the aircrew.[44]

According to current joint publications and Air Force doctrine, once a contingency develops, the theater CINC may select a DIRMOBFOR from within the theater or request one from AMC to direct airlift and air refueling operations. Technically, only commanders can exercise control (OPCON/TACON) of forces. Therefore, OPCON/TACON is retained by the JFACC instead of the DIRMOBFOR because the DIRMOBFOR can only exercise TACON over the air mobility forces when it is delegated. Thus, the centralized command of theater air mobility forces is pushed up the chain of command to the air component commander or JFACC. According to AFM 2-50, the COMALF is different from the DIRMOBFOR in that the COMALF is

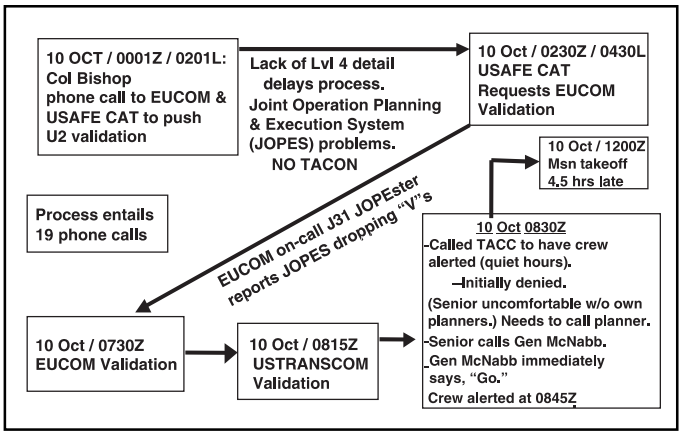

Figure 3. Coordination for U-2 Mission (10 Oct) with No TACON

U2-Mission (10 Oct) with No TACON	
Col Bishop to ETCC	EUCOM to TRANSCOM
Col Bishop to EUCOM JMC	TRANSCOM to AMC
Col Bishop to EUCOM J4D	Senior call to planner
Col Bishop to AMCC	Senior call to Gen McNabb
Col Bishop to CAT	TACC to Col Bishop
AMD Dep Chf to CAT	AMD Dep Chf to TACC/XOP
Col Bishop 2d call to CAT	Col Bishop to AMCC (Alert Crew)
Col Bishop to TRANSCOM	AMCC call for new slot time
AMD Dep Chf to USTC/MCC	AMCC call for new PPR
EUCOM J4D to EUCOM J3D	

Table 2. Coordination Phone Calls Required for U-2 Mission Validation[46]

"nominated by the appropriate AMC numbered air force, designated by the AMC commander, and approved by the theater combatant commander to exercise operational control of the airlift forces assigned to a theater or area of responsibility."[47] Still under command of the JFACC, the COMALF had true centralized control of all theater airlift forces.[48]

With the reduction in C2 authority, there is an increase in the DIRMOBFOR's responsibility for coordinating both the airlift *and* air refueling forces. The COMALF was only concerned with airlift forces. There is also a difference in grade. The COMALF during the Gulf War was a brigadier general in *command* of airlift forces only. Depending on the intensity of the conflict, today, there can be a colonel or a lieutenant colonel[49] *coordinating* airlift and air-refueling forces. According to Bishop, the DIRMOBFOR's job would be made significantly easier if the person had already pinned on brigadier general. "Through five deployments as a Brig Gen (S), I have had to, time and again (we have supported a total of ten different joint task forces/task forces), establish credibility and fight to get a seat at the table."[50] As a member of Bishop's DIRMOBFOR staff during Operation Allied Force, Major Jack Burns saw firsthand how this reduction in rank put mobility efforts at risk. If the DIRMOBFOR cannot get a seat at the *commander's table*, how do mobility issues get elevated?[51] "As demonstrated during the Gulf War, it was difficult to procure the needed support mechanisms for the airlift operations *with a COMALF*."[52] How much harder will it be to get things implemented in the next MTW with a field grade officer instead of a flag officer?

Leadership Assessment

With the introduction of the DIRMOBFOR concept, centralized C2 of theater air mobility forces for contingency operations was taken from an airlift expert in the COMALF and given to the JFACC/COMAFFOR. While JFACCs/COMAFFORs are certainly airminded individuals, they may not have an airlift background. In addition, JFACCs are more interested in the air war than they are airlift or air refueling. During a conflict, the JFACC delegates responsibility of all theater air mobility forces to the DIRMOBFOR. Tenoso gives the example of when he became the Gulf War COMALF. In his conversation with General Charles A. Horner, Tenoso said "I don't know anything about airlift. You take your airlift, and if you need anything from me, you let me know. I'm too busy fighting the air war."[53] A similar incident occurred when Bishop showed up in theater.

> Once the USAFE/CC was given TACON, General [John P.] Jumper exercised TACON of air mobility forces through Colonel Bishop. In fact, many general officers expressed to Brigadier General Bishop that the duties of the JFACC are so involved with the air war that they can't worry about the logistics tail and depend on the DIRMOBFOR to work these issues for them.[54]

In essence, the command responsibility of mobility forces was taken from the COMALF and moved up the chain of command to the JFACC/COMAFFOR. Then, responsibility minus command got delegated back down the chain of command to the DIRMOBFOR in the role of coordinator/director. That leads one to ask why control of airlift and air-refueling forces was turned over to the JFACC/COMAFFOR in order to give it back to a *coordinator*.

There are three lessons to be learned in comparing the roles of the DIRMOBFOR and the COMALF, particularly with respect to Operation Allied Force. First, future conflicts may again be fought with airpower alone. Second, if this happens, the JFACC will be busy fighting the air war and will have little or no interest in air mobility operations. Third, since *air component commanders may not know much about airlift*, they will need someone, preferably a commander, to be their expert and advisor on air mobility issues. These lessons suggest there should be a mobility expert with C2 authority (for example, OPCON/TACON) delegated directly from AMC for strategic air mobility operations and/or from the JFACC/COMAFFOR to control theater air mobility operations. As Tenoso said of the COMALF, "The position worked great!"[55]

Regarding the comparison of the functional roles performed by the COMALF and the DIRMOBFOR, there are some similarities, but there is a big difference. The COMALF was a commander who exercised OPCON and TACON over strategic and theater airlift forces. The DIRMOBFOR is only a coordinator facilitating air mobility missions. The answer to the dilemma rests in a combination of the COMALF and the DIRMOBFOR. The true role for theater air mobility leadership is a commander of airlift and tanker forces (COMATFOR).

The True Role for Theater Air Mobility Leadership

The success of my whole project is founded on the firmness of the conduct of the officer who will command it.

—Frederick the Great

Air mobility forces need centralized C2 for theater air mobility operations, rather than C2 delegated by the JFACC on an as-need basis. The DIRMOBFOR has no authority and must report to and coordinate with a lot of commands and organizations such as USTRANSCOM, AMC, TACC, USAFE, EUCOM, task force commanders, and so forth. While the mission is most important, eventually this lack of authority may affect the mission, as it did in the previously mentioned U-2 support mission that ended in 19 phone calls, a late takeoff, and a disgruntled user, when it could have taken 2 phone calls. The old COMALF can fix this; however, to meet the needs of the combined airlift and air refueling *mobility* mission, the role should become that of a COMATFOR.

In Bishop's after-action report for Operation Allied Force, he recommended the DIRMOBFOR role change to that of a commander of mobility forces, or COMMOBFOR. His observation and recommendation were:

> During contingency and airpower employment, CFACC [Combined Force Air Component Commander]/JFACC does not have the time to exercise TACON of strategic airlift assets. Additionally, command interrelationships were such that airlift's major task—the deployment of Task Force Hawk—did not come under the purview of the CFACC/JFACC (during the deployment phase, HAWK had no formal command relationship to the JTF). Create a commander of mobility forces (COMMOBFOR) or commander of air mobility forces (COMAMOBFOR) position. The position would work directly for the JFACC/theater air component commander and would be responsible for all air mobility movements. TACON could then be transferred for specific missions on an up-front, agreed-upon basis by CINCTRANS/AMC commander.[56]

If the DIRMOBFOR became a commander, the JFACC could then delegate OPCON or TACON to the COMATFOR and not have to worry about exercising C2 for air mobility forces that are part of the JFACC's focus during a contingency. The COMATFOR could set up C2 of mobility forces to best meet the needs of the JTFs and the AOC and could exercise command authority and raise mobility issues to higher levels for action.

The point in having a commander for air mobility forces is important for other reasons as well. According to Tenoso:

> The DIRMOBFOR needs to be a commander because if you (sic) get into a MTW like Desert Storm, the AFFOR will want a commander who has command responsibility for care, feeding, safety, etc. He will not want a director; he will want a commander.

Implementation of the COMATFOR

Using Table 1 as one example of the benefits of a commander versus a DIRMOBFOR, the implementation of a COMATFOR would begin with the JFC delegating C2 (OPCON/TACON) of all theater air mobility forces through the JFACC to the COMATFOR. In addition, the COMATFOR would have the ability to supervise transient strategic air mobility missions that operate into and out of the theater. As a commander, TACON passed by the USCINCTRANSCOM and AMC commander would pass directly to the COMATFOR, allowing a smooth transfer of control and placing authority at the level of responsibility. This would expeditiously and efficiently allow coordination through USTRANSCOM and AMC to have strategic airlift forces and additional air-refueling forces to augment the forces already in theater.

As a colonel, how can the DIRMOBFOR get the respect needed if the AOC director, who handles the fighting forces under command of the JFACC, is a brigadier general? As a brigadier general, the COMATFOR would be on the same level as the AOC director, greatly facilitating coordination with the general/flag JTF commanders and multinational forces.

A COMATFOR would also give air mobility troops someone to put their eyes on and say, "That is our commander. That's the one looking out for our needs, both flying and nonflying." The COMATFOR would also take care of the mobility ground support troops living in the field. The esprit de corps gained by having an air mobility commander in theater should not be underestimated.

Deputy COMATFOR

To assist the COMATFOR with air refueling and other separate JTF issues, there should be a deputy COMATFOR. Tenoso commanded the airlift forces, and Caruana commanded the air refueling forces because both were full-time jobs. The

COMATFOR should be able to call on multiple deputies as needed to accomplish each mission or assigned tasks. Other personnel can be brought in from CONUS to act as deputies to support and assist the COMATFOR during deployment, employment, sustainment, and redeployment of combat forces.

Using Operation Allied Force as an example, Bishop had several deputies working different JTFs and issues. One colonel worked Joint Task Force Shining Hope, one worked operational support airlift and C-130 issues, one handled tanker operations within the AOC, and one worked airlift issues in the AOC.[57] These O-6s would fall under the command of the COMATFOR for centralized command and control.

The Air Force should reevaluate AFDD 2-6.2, *Air Refueling Operations*, and publish doctrine that is flexible enough to meet varying organizational constructs and different mission focus for tanker operations. For example, during the initial deployment of combat forces for a given operation, AMC would provide tankers to the supported CINC through the COMATFOR. During contingencies that involve a large combat air campaign, a deputy COMATFOR for tanker operations can represent and work for the COMATFOR during the deployment phase of the operation within the AOC. When the tanker operations shift to support combat operations and when specified by the JFACC, the COMATFOR deputy for tanker operations could assist the AOC combat planners and the JFACC in planning tanker operations to support the fighters in the AOR. The deputy would maintain a link with the COMATFOR in case there is a need for theater tanker support for airlift or other supported functions through the AMD. When fighting ceases and when specified by the JFACC, the COMATFOR deputy would assist the COMATFOR with redeployment operations, while maintaining a link with the AOC director for continued support of AOC-planned missions. This scenario existed during Operation Allied Force.[58]

A Natural Choice for COMATFOR—The AMOCC Commander

Today, in place of the air divisions that existed prior to the 1992 reorganization, there are two air mobility operations control centers. One is located at Ramstein AB, Germany, and the other is at Hickam AFB, Hawaii. The AMOCC is the "theater's single command and control layer for theater air mobility operations external to a JTF."[59] The AMOCC does not work for the JFC, but it does work for the theater commander. In that role, the AMOCC "provides centralized planning, tasking, scheduling, coordination, and C2 for assigned and attached theater airlift and air-refueling forces operating in the geographic CINC's AOR." The AMOCC handles both strategic and theater missions for a seamless operation and validates user requirements and force allocations. They also have C2 teams that are deployable to austere locations.[60] The AMOCC commander handles all strategic and theater mobility operations *external* to the JFC, yet the AMOCC commander is the most experienced mobility expert in the theater, and the AMOCC commander already has a control center, tanker planners, and airlift planners controlling theater air mobility operations. Why is it limited to operations that are only external to the JFC? If the 615th and 621st Air Mobility Operations Groups (AMOG) were to downsize and combine with the AMOCC, the AMOCC commander would have a very robust control center, much like the old 322d and 834th. This setup actually occurred during Operation Allied Force. According to Bishop, "The leadership actually recognized the AMOCC as the old 322d by another name and under the command of USAFE and not AMC. There were a lot of pros that knew what they were doing when the AMD (AMOG personnel) and the AMOCC were combined."[61] By default, as the theater mobility expert with a robust command and control organization, the AMOCC commander would be a good candidate for the COMATFOR responsibilities for the theater.

The COMATFOR will bring back the centralized C2 for theater air mobility forces, providing effective and efficient utilization of theater air mobility assets through OPCON and TACON. With a centralized command authority established by the COMATFOR, the deputies will act as the air mobility experts to oversee JTFs or other operations yet remain under the command authority of the COMATFOR, providing air mobility to support anything, anywhere, anytime.

Conclusion

You may be whatever you resolve to be.

—Lieutenant General Thomas J. "Stonewall" Jackson

Tenoso, who served as the COMALF during Operation Desert Storm, and Bishop, who has served as the DIRMOBFOR for ten contingencies—most recently during Operation Allied Force—have had a chance to test the COMALF and DIRMOBFOR positions against the elements of a major conflict. The theater air mobility infrastructure needs to bring back the role of mobility commander. There needs to be one commander of all Air Force forces with a COMATFOR, who reports to the COMAFFOR/JFACC but exercises C2 over air mobility forces. The JFACC may not always be an air mobility expert, and the theater air mobility forces need a commander to command assigned and attached forces, along with supervising strategic forces that transit the theater. Then OPCON/TACON could be transferred directly to the COMATFOR, making the operation more flexible. With command authority at the theater air mobility level, the COMATFOR will have authority to efficiently and effectively execute missions because authority will be matched with responsibility. As a commander, the COMATFOR can support the theater CINC or JTF commander to meet any and all assigned tasks and objectives, whether those tasks and objectives include seven concurrent JTFs/TFs or a major air war. The COMATFOR would do this throughout the deployment, employment, sustainment, and redeployment phases of an operation.

To carry out these responsibilities, the COMATFOR needs to be at least a brigadier general in order to place the COMATFOR position on the same level as the AOC director and other flag officers. By using multiple COMATFOR deputies as needed to meet desired objectives and end states, the COMATFOR would provide a centralized command and control for theater, as well as JTF operations, by directing operations from a central location, if required, such as the AOC or other suitable location. The best location is the theater AMOCC because of theater expertise and the capability for centralized planning, tasking, scheduling, coordination, and command and control for air mobility forces. The best person for the COMATFOR job is the AMOCC commander. During peacetime operations, the AMOCC

commander manages strategic and theater air mobility assets. When a contingency arises, the AMOCC would continue to operate as normal but would now bring into focus the JFC's air mobility issues. This would also be in line with AFDD 2-6 to "establish standards that enable a smooth transition to contingency operations."[62] Overall centralized command and control of airpower must come from the air component commander, but nothing prevents centralized command and control of rapid global mobility and the air mobility forces in the COMATFOR.

Air Force and air mobility doctrine writers should reassess air mobility doctrine and the responsibilities and role of the DIRMOBFOR. Trying to support multiple small-scale contingencies and JTFs/TFs by coordinating missions may lead to a breakdown in coordination, causing some missions to fail as in the previous U-2 example. If the DIRMOBFOR was designated a COMATFOR, reporting to the JFACC/COMAFFOR and given OPCON/TACON, air mobility efficiencies would be gained, authority would be matched with responsibility, C2 would be streamlined, and OPCON/TACON could be transferred directly to the COMATFOR by USCINCTRANSCOM or the AMC commander. The COMATFOR would serve as a commander responsible for all air mobility operations, able to provide forces in a more efficient and effective manner and execute operations specific to MOOTW and the small-scale contingencies anticipated by the national security strategy, national military strategy, and joint publications.

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37. Tenoso.
38. AFDD 1, 54.
39. *Director of Mobility Forces "DIRMOBFOR" Handbook*, Fort Dix, New Jersey, Air Mobility Command, Air Mobility Warfare Center, 9th Ed, Sep 98, 25.
40. Maj Gregory M. Chase, *Wings for Lift: A Guide to Theater Airlift Control*, Research Report No. M-U 43122 C487w, Maxwell AFB, Alabama, Air University Press, Apr 85, 15; Maj John C. Millander, *Improving C2 of Strategic Airlift Forces in Contingencies*, Research Report No. M-U 41662 M645I, Newport, Rhode Island, Naval War College, 13 Jun 97, 4.
41. *Director of Mobility Forces*, 25.
42. AFDD 2-6, 20.
43. Chase, 11.
44. Hirnese.
45. Bishop interview.
46. Developed by Brig Gen Bishop's DIRMOBFORB action officers.
47. AFM 2-50, *Multi-Service Doctrine for Air Movement Operations*, Apr 92, 2:6.
48. Devereaux, 38.
49. AFDD 2, 33.
50. Bishop interview.
51. Maj John P. Burns, Air Command and Staff College student, interviewed by author, 8 Feb 00.
52. Millander, 10.
53. Tenoso.
54. Hirneise.
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56. Brig Gen Rod Bishop, Director of Mobility Forces (DIRMOBFOR) for EUCOM Lessons Learned, JTF (Joint Task Force) Noble Anvil, 23 Mar 99-7 Jul 99, 437th Airlift Wing Commander, Charleston AFB, South Carolina.
57. *Ibid*.
58. *Ibid*.
59. AFDD 2-6, 17.
60. *Ibid*.
61. Bishop.
62. AFDD 2-6, 15.

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(*Light, Lean, and Lethal* continued from page 3)

rate of march, leaving his packtrain well behind the attacking force.[14]

The Battle Begins

The battle occurred in three phases and at three separate locations.

Reno, up the Middle. The first to engage the combined Sioux and Cheyenne forces was Reno and his 140 troopers and scouts. He forded the Little Bighorn south of the village and advanced along the west bank to the edge of the encampment. He had been assured the rest of the force would support his attack. As he advanced, he was met by increasing numbers of mounted and running warriors to his front and left flank. The combined force of Sioux and Cheyenne warriors was much larger than he had expected. Post-battle estimates of warrior strength were 3,000-5,000. The highest prebattle estimate had been 1,000-1500, though Custer's own Indian scouts believed the number was much higher.[15] Reno halted the advance and took up a defensive circle in a large clump of trees near the river. Measurement of the village after the battle revealed a camp 4 miles long and a half mile wide. Reno could see that his brigade was being encircled. Indian warriors were also running along the bank across the river. Neither Benteen's nor Custer's force had come to his assistance. After 30 minutes of fighting in the trees, Reno ordered his men across the river to a more defensible position. Not all of his men heard the order, and several were left in the trees. He withdrew most of his force and established a defensive position among the high bluffs on the opposite side of the river.[16]

Benteen, to the Left. During the same time, Benteen's brigade searched the plain to the west and found neither trail nor Indian. By the time he returned to the Little Bighorn, Reno's force had recrossed the river. Benteen joined forces with Reno and led the effort to build defensive positions along the high bluffs. From those positions, the combined brigades fought the evening of the 25th and all day the 26th against continuous attacks. They, too, would likely have been entirely wiped out had Terry's force not arrived the morning of the 27th.[17]

Custer, to the Right. Custer, with his five troops, proceeded downstream on the east side of the Little Bighorn valley. (Since there were no survivors, his final moves and intentions can only be surmised. However, subsequent interviews with Sioux and Cheyenne warriors, as well as studies of spent bullets and body locations, have added some understanding.) Custer attempted either an actual or a feint crossing at a point directly across the river from the center of the village. He withdrew and again headed north, perhaps to find a point of attack at the north end of the village[18] He must have been surprised at the size of the village and the number of warriors that rushed to meet him. His troops dismounted on a sloping field, cut by numerous ravines, unsuitable for mounted maneuver. They formed several defensive circles. Early in the battle, the advancing Sioux stampeded their horses. This deprived them not only of a way to escape but also of the spare ammunition. Armed with only pistols and carbines and the ammunition each soldier carried, they succumbed to a force at least ten times their number.[19] Thus, the entire force was pinned down, encircled, and killed.

Was it Just Bad Leadership?

Most historical analysts have focused on Custer's, Reno's, and Benteen's actions and leadership. Historians have alternately criticized the decisions of all three. It was well known that Benteen and Reno (who survived) had been critics of Custer. It should be remembered, however, that all three of these men were decorated Civil War veterans, and all had been commended for acts of courage. There were other factors that weakened the force. For instance, communication between the widely dispersed units was nonexistent.[20]

> Mounted couriers were the fastest means available but were still slow and uncertain. Soldiers could be used as couriers only when the route was both familiar and safe; otherwise, this duty demanded skilled frontiersmen. The slowness, however, meant supplies had to be arranged far in advance and could not be adjusted as needed. Another consequence was that concerted action between far-separated columns was nearly impossible.[21]

No specific battle plan had been communicated before the three elements divided, and no one expected several thousand Indian warriors to be present. No one, not even the Indian scouts, had ever even seen a Sioux/Cheyenne encampment of more than 600-800 warriors. Most analysts, whether Custer fans or critics, agree that the principal cause of the defeat, was Custer's dividing of his force in the face of an enemy of unknown size, allowing the much larger Indian force to fight his units one at a time.[22] The Army commission that examined the events found no fault on the part of Reno or Benteen.[23] Since there were no eyewitnesses to the last 2 hours of Custer's actions and because of his fame as an Indian fighter, the board was equally reticent to place blame on him. The board's conclusion was Custer attacked a force of unknown size, which turned out to be larger than predicted. Dividing his force into three separate elements (a tactic that had *worked well* for him on multiple occasions in both the Civil War and previous Indian campaigns) further diminished his capability. Finally, by attacking alone on the 25th, he eliminated an opportunity for a combined attack with Terry and Gibbon.[24] So is that it? A few bad choices based on poor intelligence? Were there other factors that affected the outcome?

Changing Times, Changing Force

Custer lived during a period of postwar transition, similar in many ways to our own post-Cold War and Desert Storm era. While Custer had perfected his tactics in one kind of war, in 1876, he was leading an expeditionary force in an entirely different kind of war. To make matters worse, the Army had made no attempt to develop doctrine and strategy for the Indian campaigns.

> The Army brought to the task no new strategy. In fact, there had never been any formal strategy for fighting Indians, and there never would be. The generals looked on Indian warfare as a momentary distraction from their principal concern—preparing for the next foreign war.[25]

In this war with the Indians, the *cavalry* had become the *primary* attack force, supported when and where possible by artillery and infantry. From 1863 to 1865, Custer had led a group of volunteers who were committed to winning the war. The men submitted willingly to capable leadership. They knew each battle hastened the war's end and their return home. When the war ended, most of them did go home. The composition of the force after the war changed markedly. The cavalry units in the Far West were mostly manned with recruits from immigrant families.[26] Units often had as many as 40 percent trainees. The Civil War was *popular* and had a clear, expected end, but duty in the west was not so well defined. It was endless drudgery, units had high rates of desertion,[27] and soldiers who remained were often incapacitated by alcohol.[28] Actual combat experience was rare. It is estimated that as many as 30 percent of the men who rode with Custer had never been in combat prior to the Little Bighorn.[29]

A Different Kind of Enemy, A New Kind of Warfare

As Custer pursued the Sioux across Wyoming and Montana in 1876, he was attempting to find and fight an entirely different kind of enemy, in surroundings much different than Gettysburg and the Shenandoah Valley. The Army rarely was able to locate and fight Indians in large numbers, and the Indians did not engage in frontal, force-on-force battles. They chose opportunities where they momentarily had superiority and surprise. Their warfare consisted of guerrilla tactics, and when engaged by a larger force, they would disperse and *disappear* in the vast plains. Only a mobile force was going to be able to catch this elusive enemy—a force that was light and fast.

What About Logistics?

There were *significant* logistics decisions that contributed to the outcome. Perhaps the best known was Custer's refusal of the Gatling guns and additional forces offered by Terry. Custer reasoned that dragging the guns and ammunition over mountain trails would have decreased his speed and ruined his chances of finding the elusive Sioux.[30] A lesser known decision was Custer's order to box all of the sabers and leave them aboard the supply ship, the *Far West*. Custer felt they would make too much noise and there was little chance of close-in combat.[31] In the final hours of pursuit, Custer increased the rate of march, leaving his baggage train and reserve ammunition far to the rear. There are several other lessons from the Little Bighorn that offer valuable insight for modern expeditionary force planners and warriors.

Expeditionary Logistics

Logistics support in the Far West was extremely difficult. Supporting concentrations of men and horses in the field was always a huge task, but in the desolate Far West, it was nearly impossible to keep every man and horse supplied all the time. The difficulty of moving, storing, and calling forward military supplies reduced the effectiveness of forces and reduced the scope of the possible. Field commanders were tethered to and limited by a very rudimentary logistics infrastructure. John S. Gray's analysis of frontier logistics is extremely insightful and thought provoking:

> These preliminaries to the Sioux campaign of 1876 provide a glimpse into the difficulties the frontier army faced in conducting a major campaign against the plains Indians in the formidable wilderness of the West. The problems stemmed not from army incompetence, but from the unusual conditions, especially alien to a force trained in the Civil War in the developed East. For the benefit of today's readers, these monumental problems deserve an explanatory note.
>
> The West posed special problems in logistics—the transport of troops and their essential supplies. Veritable mountains of rations, shelter, clothing, arms, and ammunition for the men, and forage for the animals had to be delivered over long distances. Facilities for such transport were readily available in the densely populated East but not in the forbidding, unsettled, and arid West. There, steamboats could ply only a rare river and then only in spring and summer. The Union Pacific was the only railroad west of the Missouri, and winter service was erratic indeed. Even wagon roads were few and rough, which translates to long and slow. Army contract trains, usually ox-drawn, made only 15 miles a day to allow grazing time, for to carry forage meant no payload. Quartermaster trains that supplied immediate needs of troops on the march were usually mule-drawn and could make 20 miles a day. As we have seen, even the assembling of troops and supplies at a staging base was time-consuming and often impossible in winter.
>
> After the staging base was left, transport problems intensified, for there were often no roads whatever. Yet, a trail suitable for heavily laden wagons simply had to be found, with essential wood, water and grass at each night's bivouac. In unfamiliar country these requirements called for expert guides. For any prolonged operation, supply depots had to be established in the field and then replenished by successive supply trains; troops, usually infantry, had to be detached to guard such depots.
>
> The cavalry was the most mobile, but its range was inversely proportional to its speed. The range could be extended and speed still maintained if the column was supplied by a packtrain, but only Gen. Crook [Major General] had developed an efficient one that could keep up with the cavalry it served. It consisted of specially trained mules managed entirely by expert civilian packers and therefore *too expensive for general use*. Others had to rely on draft mules and novice soldier-packers that both slowed and weakened the cavalry column.[32]

Sheridan had ordered a winter campaign in 1875. He knew that was when the Indians were at their weakest. Indian ponies were undernourished and generally ineffective during the winter months. Villages were scattered, and a number of warriors were always away from the village hunting for food. He failed to reckon with the logistical problems of mounting forces in isolated, winter-bound posts.[33] During the winter, natural fodder was not available in sufficient quantities to support a large equestrian force. Sheridan and Custer had conducted smaller winter campaigns previously. The Washita Campaign (winter 1868) had used *400 wagons* to support the combined cavalry and infantry force.[34] However, a three-division force simply could not be supported in a winter campaign. After months of delay, when the spring of 1876 arrived, the steamboat *Far West* was loaded near Fort Lincoln, at Bismarck, and began to move Terry's supplies up the Missouri and Yellowstone Rivers. The troops and horses moved overland from Bismarck, west to the Yellowstone River, where they would link up with their resupply ship. The overland contingent was well stocked for the march—150 wagons drawn by 6-mule teams, an equal number of 2-mule wagons, a towed battery of Gatling guns, a herd of cattle, and a herd of extra horses and mules. The whole group, soldiers, and supplies, stretched over *4 miles*. The *Far West* was also well stocked, including a battery of Gatling guns and 10,000 rounds of half-inch ammunition, as well as large stocks of food and medical supplies.[35]

Logistics Decisions

Custer sized and equipped his force by evaluating his own capability compared to probable enemy capability and intent. Custer's decision to leave Gatling guns, sabers, and his own spare ammunition in the rear left little flexibility to adjust to changing conditions and new intelligence. Once engaged, both Custer and Reno sent couriers to the packtrain, requesting it make every effort to catch up.[36] Eventually the pack mules, which carried ammunition, were detached from the rest of the baggage train to speed their progress. In his careful time-motion analysis, Gray determined that the mules with ammunition arrived at the Benteen/Reno position on the bluffs at 5:19 p.m. The rest of the baggage arrived at its location 10 minutes later. The Reno/Benteen position *was 4.5 miles* from Custer's battlefield, easily another 30 minutes away. By 5:12 p.m. (7 minutes *before* the ammunition arrived at the bluffs), heavy firing had ceased at Custer's location.[37] While the newly arrived baggage was of great use to Benteen's and Reno's forces during their battle over the

next 24 hours, it was clearly too late to support Custer. A clear pattern emerges. Custer continually lightened his force in order to achieve maximum speed. These decisions were based on his estimate of enemy numbers and intentions. By the time he realized these estimates were wrong, his force had been trimmed too much to respond to the changes. Even his own (relatively close) supplies were unavailable when he needed them because of his decision to close the distance with the enemy quickly. Being light and fast enough to keep pace with the Indian was only possible by becoming *like* the Indian, especially as it pertained to logistics. A traditional cavalry unit could not expect to remain in contact with its forward supply depots *and* keep up with the mobile Indian. Therefore, tradeoffs were made, capabilities jettisoned, and some useful weapons left behind. At the moment of battle, however, the attacking force lacked the resources to win; all of the benefits of speed achieved through being light were lost. Custer had caught up with the elusive Sioux but lacked the capability to deliver a lethal blow to his adversary or to defend his own force.

Issues for Today

The Services are shaping forces designed for rapid mobility and quick response—forces that can deploy rapidly and fight anywhere. To do this, there is a move toward lighter/faster forces.[38] Though they reduce deployment time and beddown footprint, lighter forces are more vulnerable. Is it then a clear *either-or* problem? *Either* we field large, heavy, slow forces, which can win, *or* we field small, light, fast forces, which may be in jeopardy? Clearly, there is a need for both kinds of forces. However, if arrival speed and rapidity of engagement are high priorities, there are factors affecting light, mobile forces that must be considered.

Unity Between Intelligence, Operations, and Logistics

Most analysts concur that the critical failure in Custer's defeat was poor intelligence of enemy strength. Consequently, decisions to split his force and move ahead of the packtrain left him with too few soldiers and not enough firepower. Intelligence of enemy capability and intent is critical in sizing the expeditionary force. To successfully plan and execute a rapid response package, the *loggie* must be brought in at the earliest stage of planning. Support not only must be tailored to the requirements of the warfighter but also must factor in enemy strength and intent. Intelligence is rarely 100 percent accurate. Many items of information needed to make operational decisions are not always available. In the absence of critical information, we need to build capacity into logistics that accommodates changing estimates of enemy capability. Logistics planning needs to include estimates of enemy capability to interdict supply and should calculate likely attrition. The intelligence, warfighter, and logistics commands need to constantly coordinate new information. If a decision is made to delete a weapon system or limit units to only a few days of supplies on hand, all three communities need to consider the implications.

"Call in the cavalry . . . "

In the West, the cavalry's mobility made it the force of choice. It could move quickly to a *hot spot*. However, there were instances when the cavalry was dispatched with disastrous results. Custer's defeat at the Little Bighorn is the best known, but there had been others. Only days before Custer's loss, Crook's cavalry was mauled near the Rosebud River.[39] Though Custer is credited with a victory at Washita, Major Elliot, his second in command, and a dozen troopers were surrounded and annihilated during that same battle.[40] There are circumstances that demand a mobile force. However, a light force may not always be the best solution. In some scenarios, we will need to take the time for *heavy* units to deploy. While Terry planned to use the cavalry to chase and pin down the enemy, he also planned to use infantry and artillery. He understood that the cavalry could be defeated if not properly supported.

Choosing Time, Place, and Pace (or, the closer you get to the enemy, *the closer he is to you*!)

Building an airbase has historically been a very slow process. Doctrine and strategy, force size, and national objectives have been sifted annually. Basing decisions flowed from strategic policy. Generally, airbases were sited *out of harm's way*. Buildup and stockage took months, even years. Responsibility for defending the airbase has sometimes been contentious. The means and methods of airbase defense have been inconsistent during the fixed-base era. As the Air Force moves toward expeditionary air forces, it will need to decide which units will provide base defense. Selection of airbase sites will also bring new challenges. Speed and current (rather than potential) support capability may move units to places that have exceptional operational capability but shortfalls in base defense and logistics support. Bare and semibare bases will need to be selected not only for operational capability but also for defense feasibility and logistics supportability. We have grown accustomed to *NATO-like* bases with full support capability. But in parts of the world, the number of suitable bases is limited. While a light combat force may fit well at a selected location, the required base defense and engineering units may make the total package anything but light. The closer the base is to the enemy, the more urgent the defense solution.

On Hand Versus on Time

A critical component of expeditionary warfare is assured supply. The amount of stuff required *on hand* must be balanced with the amount of stuff that can be delivered *on time*. Determining how much of each will always be difficult. During Desert Storm, there were isolated incidents of the enemy's surrendering to unmanned aerial vehicles. In other conflicts, enemies have fought to the last man. The enemy's *will-to-fight* factor affects the rate of expenditure and the requirement for on-hand stuff, especially munitions. Historically, we have been unable to reliably calculate the number of bombs it takes to deter or halt an enemy. Custer believed the weapons and ammunition carried by each trooper were sufficient. After all, each man had not only the bullets he carried on his person but also reserves in saddlebags. There was enough Army firepower within a 50-mile radius of Custer's position to wreak havoc on an unlimited number of Indians. But it was not available where needed. Custer's own reserves were diminished, first, by his decision to position himself in advance of his packtrain and, subsequently, by Indians chasing off the horses. If a unit will deploy with only 3 days of supply today, for instance, what is the backup plan if the lines of supply are cut during those 3 days? With regard to critical supplies, such as munitions and fuel, what rates of expenditure are likely to achieve the goals, and are there sufficient quantities on hand for the moment and the future? Security of on-hand supplies also has a cost. Custer committed 20 percent of his force to defend his own packtrain. These men were desperately needed

warfighters. Establishing and protecting support in an expeditionary mode will require initial planning and continual tuning as conditions change.

Weapons of Choice Plus Flexibility

As Custer chose to leave behind Gatling gun batteries and sabers, so must the modern expeditionary commander leave behind some capabilities. Selection of weaponry from a list of possibles will be difficult. The decision will need to be rooted in enemy capability and intent. It will also be affected by the availability of those weapons and their deployability. Air Force planners have rarely been faced with selection of only one or two types of weapons, fuses, and delivery options, but rapid-response forces will have fewer options. Light forces will need to be carefully shaped to maximize lethality. Decisions, like Custer's—to leave the sabers behind—need to be made after considering any potential changes in enemy strength and intent.

Quality of the Force

In the 1879 inquiry, several eyewitnesses stated that fire control was poor. Many of the men fired their weapons rapidly, often without aiming, reducing effectiveness and ammunition.[41] Custer's unit was like others in the Army at the time. There was a high percentage of recruits, and many soldiers had no combat experience.[42] The rate of ammunition consumption was related directly to the quality of the force. Parallels exist today. Many aircraft maintenance areas are undermanned. There is a shortage of experienced technicians. Experienced seven- and nine-level troubleshooter numbers have also decreased. An experienced specialist might use only one *widget* to accomplish a repair while an inexperienced one might use two or maybe even three. A less experienced/trained force will affect consumption of support and warfighting materiel. Is the 3-day package sized to well-trained technicians? It is interesting to speculate, for instance, what Custer might have accomplished at the Little Bighorn with troopers from the 7th Michigan Brigade, his Civil War unit. It is possible that a unit with greater discipline, fire control, and battle experience might have had sufficient ammunition to repel the Indian counterattack. More experienced troopers might not have allowed their horses to be stampeded. Each factor (quality of the force, experience, operational capability, enemy intent, and so forth) is linked to the others. Under ideal conditions, with overwhelming force, weaknesses may remain hidden. The expeditionary force may surface weaknesses that did not affect large force packages.

Combining Forces—Joint and Allied

The Indian scouts attached to Custer's overland force were among the best in the Montana and Wyoming area. However, they were not Custer's own scouts. He had not worked with them before and had not established confidence in their ability.[43] As a result, he did not act on their assessment of enemy strength being much higher than 1,500. He also did not believe they had located the main Sioux village, though several of the scouts told him they had seen rising smoke and a large herd of ponies. Immediately prior to battle, these *untried* scouts were his only source of intelligence. This was not a formula for success. Expeditionary forces will deploy to places where few previous treaties and agreements exist. Possible hot spots may take them to places where military-to-military exchanges have been few and allied exercises have been infrequent. Expeditionary forces will be faced with unfamiliar terrain, bases, support, contractors, ports, infrastructure, and local sources of information. There will be language difficulties. Like Custer, the on-scene commander may have little time to build relationships with local forces and agents.

Effectiveness Versus Efficiency

The goal of modern logistics is to precisely calculate requirements by modeling past consumption and deliver the right amount of stuff to the point of use a little before it is needed. The optimum solution is to shoot the last bullet at the last enemy, on the last day of the war. The problems in this approach arise, not from inability to construct accurate consumption models, but from difficulty blending enemy capability and action into the model, as well as other variable wartime factors. The light, mobile force seems to promise dollar savings. It is important that, while we move the military toward a higher ratio of light-to-heavy forces, the desired *efficiencies* do not undercut *effectiveness*. This is a tension that shaped Custer's force, one Americans will debate in each new generation. How much is too much? Can we ensure victory with fewer forces and dollars? Which numerical ratios and formulas best capture combat effectiveness and budgetary efficiency?

This dialog from Robert Vaughan's historical novel *Yesterday's Reveille* cleverly portrays this tension, as expressed in Custer's time.

> Congressman: "The yearly cost for keeping the Seventh Cavalry—including all pay, allowances, food, and equipment—is one million, two hundred and thirteen thousand dollars. Last year, there were two hundred and seventeen hostiles killed. That means it is costing the United States five thousand five hundred eighty-nine dollars and eighty-six cents to kill *each Indian* . . . . Now I ask you, General Custer, do you consider this an effective utilization of Federal money?"
>
> General Custer: "Mr. Congressman, if you consider the Seventh Cavalry to be nothing but bounty hunters, then I would agree that too high a bounty has been placed on the head of each Indian. If, on the other hand, you regard the Seventh as a peacekeeping organization, then I would ask you to turn your figures around. There are approximately three-quarters of a million men, women, and children in the Department of the Missouri who were not killed last year. I ask you, sir, if you consider the lives of these American citizens to be worth a dollar and sixty-three cents apiece?"[44]

Conclusion

These issues, and others, must be analyzed as we attempt to shape light, mobile forces and doctrine to accommodate political, demographic, and military realities. We would be wise to consider similar periods in our national and military history. Custer's expeditionary force was remarkably mobile and light for its day. His *lightness*, though, reduced lethality and margin for error. Our responsibility is to learn from Custer's successes and duplicate them, understand his mistakes and correct them.

Notes

1. Gregory J. W. Urwin, *Custer Victorious*, East Brunswick, New Jersey; London; and Toronto: Associated University Presses, 1983, 44.
2. W. A. Graham, *The Story of the Little Bighorn*, Mechanicsburg: Stackpole Books, 1994, 8.
3. Urwin (particularly testimony of men who served with Custer during the Civil War), Chap 12, 265-286. During the early years of the Civil War, the Union cavalry had been notoriously ineffective, poorly trained, and poorly led. However, by 1863, under the tutelage of Sheridan and Pleasonton, the Union cavalry had improved dramatically. By the end of the war, Custer's units had won numerous battles.
4. Jay Monaghan, *Custer: The Life of General George Armstrong Custer*, Boston and Toronto: Little Brown and Company, 1959, 314.

5. Urwin, 73-82.
6. Monaghan, 240-242.
7. Graham, 96
8. Graham, 12-13 and 114-117 This letter contained the written instructions to Custer, which were recorded after the meeting aboard the *Far West*. While some latitude is granted, it is clear where each of the forces were to move.
9. John S. Gray, *Custer's Last Campaign*, Lincoln and London: University of Nebraska Press, 1991, 205 and 229.
10. Gray, 228, 251, 272, 338. These time and motion study charts are an extremely precise calculation of movements during the last hours of Custer's attack.
11. Gray, 238, and Graham, 29.
12. Robert M. Utley, *Cavalier in Buckskin*, Norman and London: University of Oklahoma Press, 1988, 182-183.
13. Graham, 27 and 96.
14. Utley, 183.
15. Gray, 212, 226, 244. There is great variance in numbers. Low estimates, before the march up the Rosebud, were 400-800. As signs of many trails joining increased, so did the estimates. One scout estimated as high as 2,500 on the morning of the 25th. Custer felt that. regardless of the number, the Indians would flee when they saw his column advancing and his troops could whip any number of Indians. See also, Graham, 33-34. Graham's book was researched and published the closest to the actual events. He talked to eyewitnesses, and he estimates the actual number of warriors to be 4,000!
16. Graham, 36-48.
17. Graham, 51-61.
18. Gray, 357-361.
19. Utley, 185-191.
20. Graham, 23,24.
21. Gray, 133.
22. Gray, *xiv-xv*.
23. Gray, 102-104
24. Gray, 152-158, These pages contain a copy of the final report from the 1879 court of inquiry. It delineates the actions of each primary officer and concludes each acted properly and under orders.
25. Utley, 42.
26. Utley, 45-46, 168.
27. Utley, 45-46, 50, 52, 53.
28. Utley, 45. A major shot and killed himself in a fit of delirium tremens during the 1867 summer campaign. Alcohol abuse was not limited to the enlisted troops.
29. Graham, 117-118.
30. Graham, 112, and Gray, 170. The guns were usually transported in wagons but could be disassembled and carried on mule packtrains. Custer chose neither option. He told Terry the guns might embarrass him. He also declined the offer of additional mounted troops. Apparently, Custer felt his own trooper's firepower was sufficient. It is interesting to note that Reno had carried the guns with him on his scout up the Rosebud earlier in the month. He had injured almost a dozen mules in the process. See Gray, 175 and 202.
31. Utley, 174. The famous Anheuser-Busch painting of "Custer's Last Stand" is flawed in this detail, as it shows Custer with a saber in his hand, a weapon he did not have available, Utley, 102.
32. Gray, 132-133.
33. Utley, 201-204, and Gray, 127.
34. Monaghan, 309. In the last day of pursuit, Custer advanced with 800 troops and only a few wagons with tents and food. The cavalry could move quickly with less supply support for about 2 days, then needed to return to the supply wagons.
35. Utley, 167-168.
36. Graham, 49, 53, 54.
37. Gray, 272-273 and 301.
38. *US News and World Report*, Cover Story, 18 Sep 00.
39. Utley, 178.
40. Utley, 68-69.
41. Graham, 150-152.
42. Graham, 117-119.
43. Gray, 200-201.
44. Robert Vaughan, *Yesterday's Reveille, An Epic of the Seventh Cavalry*, New York: St Martin's Paperbacks, 1996, 201-202.

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(Women in Logistics continued from page 9)

11. R. Miller, L. Cohn, H. Gleckman, P. Dwyer, and A. Palmer, "How Prosperity Is Reshaping the American Economy," *Business Week*, 14 Feb 00, 104.
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(Multinational Logistics continued from page 17)

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(Cultural Change continued from page 22)

management of organizational culture. Unlike the hard tooling of aircraft, machinery, computer systems, and C3I networks, these *soft tools*—management practices, shared values, cultural norms, assessment instruments—are the next frontier in sustaining and supporting the Air Force's evolving global defense mission.

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(Logistics Research continued from page 28)

Some specific areas of focus are:

- Evaluating the impact of alternative supply policies on customer support. Some of these policies relate to providing premium support for certain squadrons, considering centralized intermediate-level maintenance facilities, support for major end item overhaul maintenance at depots, and improving the execution of contract repair.
- Formalizing and implementing a methodology for determining supply chain manager performance targets by incorporating the impact of uncontrollable factors.
- Defining strategies to improve piece parts support for depot repair.
- Finalizing a methodology for readiness-based contract repair management.
- Conducting studies of interest to Air Expeditionary Forces, such as minimization of deployment *footprint* (shipping weight) for a squadron, given an operational flying requirement.
- Providing valuable information for weapon system management by integrating databases that depict asset status and constraints.

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