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Volume XXX,
Number 4 and
Volume XXXI
Number 1

AIR FORCE JOURNAL *of* LOGISTICS



Volume XXX, Number 4 and Volume XXXI, Number 1

Winter 2006/Spring 2007

AFRP 25-1

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Journal Telephone Numbers - DSN 596-2335/2357 or Commercial (334) 416-2335/2357

The Air Force Journal of Logistics (AFJL), published quarterly, is the professional logistics publication of the United States Air Force. It provides an open forum for presenting research, innovative thinking, and ideas and issues of concern to the entire Air Force logistics community. It is a nondirective publication. The views and opinions expressed in the Journal are those of the author and do not necessarily represent the established policy of the Department of Defense, Department of the Air Force, the Air Force Logistics Management Agency, or the organization where the author works.

The Journal is a refereed journal. Manuscripts are subject to expert and peer review, internally and externally, to ensure technical competence, accuracy, reflection of existing policy, and proper regard for security.

The publication of the Journal, as determined by the Secretary of the Air Force, is necessary in the transaction of the public business as required by the law of the department. The Secretary of the Air Force approved the use of funds to print the Journal, 17 July 1986, in accordance with applicable directives.

US Government organizations should contact the AFJL editorial staff for ordering information: DSN 596-2335/2357 or Commercial (334) 416-2335/2357. Journal subscriptions are available through the Superintendent of Documents, US Government Printing Office, Washington DC 20402. Annual rates are \$15.00 domestic and \$18.75 outside the United States. Electronic versions of the Journal are available via the World Wide Web at: <http://www.afjma.hq.af.mil/lgj/afjlhome.html>. The Journal editorial staff maintains a limited supply of back issues.

Unsolicited manuscripts are welcome from any source (civilian or military). They should be from 1,500 to 5,500 words. The preferred method of submission is via electronic mail (e-mail) to: editor-AFJL@maxwell.af.mil. Manuscripts can also be submitted in hard copy. They should be addressed to the Air Force Journal of Logistics, 501 Ward Street, Maxwell AFB, Gunter Annex AL 36114-3236. If hard copy is sent, a 3.5-inch disk, zip disk, or compact disk containing an electronic version of the manuscript should accompany it. Regardless of the method of submission, the basic manuscript should be in Microsoft Word or WordPerfect format, and all supporting tables, figures, graphs, or graphics must be provided in separate files (preferably created in Microsoft Office® products; if Microsoft Excel is used to create any of the charts or figures, the original Excel file must be supplied). They should not be embedded in the manuscript. All submissions will be edited in accordance with the AFJL submission guidelines.

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Humanitarian Logistics

A Guide to Operational and Tactical Logistics in Humanitarian Emergencies



Lieutenant Jason L. Bammel, USN
Captain William K. Rodman, USAF



ABOUT THE AUTHORS: CAPTAIN WILLIAM RODMAN, USAF, IS THE MATERIEL MANAGEMENT FLIGHT COMMANDER AT THE 366th LOGISTICS READINESS SQUADRON, MOUNTAIN HOME AIR FORCE BASE, IDAHO. AT THE TIME OF THE WRITING OF THIS HANDBOOK, CAPTAIN RODMAN WAS AN INSTRUCTOR IN THE SCHOOL OF SYSTEMS AND LOGISTICS AT THE AIR FORCE INSTITUTE OF TECHNOLOGY, WRIGHT-PATTERSON AIR FORCE BASE, OHIO. LIEUTENANT JASON BAMMEL, USN, IS A LOGISTICS INSTRUCTOR IN THE SCHOOL OF SYSTEMS AND LOGISTICS AT THE AIR FORCE INSTITUTE OF TECHNOLOGY, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.

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> *Foreword*



This handbook addresses many of the common questions and pitfalls encountered by Air Force personnel involved in humanitarian logistics. However, as operations continue to evolve, implementation and execution will also change. Therefore, this book should be used as a reference only—Department of Defense and Air Force directives will always take precedence.

The views expressed in this document are those of the authors and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the US Government.

All questions concerning this guide should be directed to the following:

Air Force Institute of Technology
School of Systems and Logistics
3100 Research Blvd
Kettering, OH 45420-4022
Commercial (937) 255-7777 or DSN 785-7777

> *Introduction*



Humanitarian assistance operations will increasingly become a required area of proficiency for Air Force logisticians. These operations present challenges not typically found in combat as a result of the urgency of planning, ambiguous command and control, and difficulty in communicating with numerous organizations both inside and outside of the Department of Defense (DoD). The most common lessons learned

from recent humanitarian actions reveal that poor coordination, lack of information sharing, inadequate education and training, inconsistent processes, and logistical capacity limitations impeded the logistics responsiveness of military missions. Clearly, providing humanitarian assistance presents additional challenges for military logisticians, and today's Air Force logistician must prepare for these challenges.



Chapter 1 - Today's Increasing Requirements

The global environment has radically changed since the end of the Cold War. For many years, as the worldwide humanitarian networks were still maturing, there were fewer direct requests for assistance from the superpowers. When the US Government (USG) received requests for humanitarian relief, countries mainly asked for assistance with major natural disasters such as earthquakes, floods, and droughts. In places where the world's superpowers were not competing for influence, neutral members of the international community and surrogates of the superpowers typically managed humanitarian challenges.¹

Currently, America must take on a much greater role in providing humanitarian assistance. Complex contingencies involving conflict and humanitarian components have become more frequent, and such contingencies now make up the majority of the requests for US humanitarian relief.² In addition, dangerous

combinations of demographic, economic, and social forces mean that the need for military humanitarian assistance will continue to grow. Between 1990 and 2000, the total number of natural disasters such as wildfires, floods, and hurricanes increased worldwide from 650 to 850 per year.³ As further evidence of this trend, disasters occur today with four times more frequency, last longer, and cause more damage than in the 1980s.⁴

Department of Defense (DoD) leaders have emphasized the importance of military humanitarian assistance. Following the aftermath of Hurricane Katrina in 2005, President George W. Bush said that challenges on the scale of Katrina now require a broader role for the Armed Forces in bringing to bear the "institution of our government most capable of massive logistical operations on a moment's notice."⁵ The ability to deliver humanitarian assistance effectively represents a key element



Air Force National Guard Forces Prepare to Provide Medical Support During Hurricane Rescue Operations

within the *National Security Strategy*. According to the *National Military Strategic Plan for the War on Terrorism*, the military's participation in humanitarian assistance permits the establishment of conditions that counter ideological support for terrorism. This strategy says of humanitarian assistance that it contributes to winning the Global War on Terrorism by "demonstrating benevolence and goodwill abroad, reinforcing support for local governments, and mitigating problems that extremists exploit to gain support for their cause."⁶ Furthermore, the *Stability Operations Joint Operating Concept* states, "The Joint force ... will provide security, initial humanitarian assistance, limited governance, restoration of essential public services, and other reconstruction assistance."⁷

The Air Force currently has little formal written instruction pertaining to the unique aspects of humanitarian logistics.⁸ Nevertheless, the Air Force possesses many important capabilities that go beyond materiel support to relieve the results of natural or man-made disasters. The Air Force may airlift medical supplies, provide tents to refugees, or feed civilians in war-torn areas. The Air Force can rapidly respond with medical teams, civil engineers, and critically needed support to relieve immediate suffering and assist the host government at the start of a long-term reconstruction effort. Air mobility, security, communications, intelligence, surveillance, reconnaissance, and search and rescue forces, among others, can all significantly improve the ability of unilateral, Joint, and multinational organizations conducting humanitarian assistance missions.⁹

This handbook serves as a guide to help logisticians meet the growing demand on today's air and space expeditionary forces in performing foreign and domestic humanitarian missions. It combines current research and numerous references from Air Force and Joint doctrine as well as articles and lessons learned relating to humanitarian operations. This handbook can help prevent Air Force personnel from repeating past mistakes. It can also serve as a guide to ensure that the powerful capabilities that the Air Force possesses are brought to bear in humanitarian assistance missions with maximum effectiveness in alleviating human suffering.

The tactics, techniques, and procedures outlined in the chapters that follow are intended to guide a commander and staff in the planning and execution of humanitarian activities. The handbook is not all-encompassing, and is meant as a starting point for an Air Force member who is perhaps unexpectedly called upon to provide humanitarian assistance or disaster relief. This guide does not prescribe activities that are better addressed in other publications. See the references in Appendix E.

Chapter 2 - Operational Environment

Types of Missions

The Air Force may participate in many types of humanitarian missions including disaster relief, dislocated civilian support, security, technical assistance and support missions, consequence management, and humanitarian and civic assistance. A single combat or humanitarian assistance operation may contain more than one of these types of missions.^{10, 11}

Relief Missions

Relief missions, or disaster relief missions, refer to efforts to mitigate the consequences of natural or man-made disasters. Domestic and foreign disaster relief can result from a wide variety of causes—hurricanes, earthquakes, floods, oil spills, famine, and conflict. In response to disasters, the Air Force may be called upon to prevent the loss of life; alleviate suffering; protect property; provide food, water, and medical care; construct shelters; provide basic sanitation facilities; and repair public facilities.¹²

Many relief organizations such as the United Nations (UN) nongovernmental organizations (NGO), and international organizations [IO], already exist and possess the charters, expertise, and experience to conduct highly effective relief missions. In the absence of these organizations, or when they require additional support, the military conducts relief missions to provide *prompt aid* in alleviating the suffering of disaster victims.¹³

Dislocated Civilian Support Missions

Dislocated civilian support refers to missions designed to support the resettlement of refugees, migrants, stateless persons, evacuees, and internally displaced persons. The military's role may include: camp organization (construction and administration), provision of care (food, supplies, medical attention, and protection), and placement (movement or relocation to other countries, camps, and locations). In dislocated civilian support missions, the military force should begin by allocating DoD services and facilities to non-DoD agencies. The support force can then concentrate its resources on other humanitarian assistance efforts. Airmen working in logistics roles should anticipate that dislocated civilian support missions frequently have a long-term duration and require massive resourcing not readily available through DoD sources. Finally, DoD personnel should request guidance from the Department of State (DoS) to help Service members distinguish between a refugee and other types of dislocated civilians. Knowing this difference may have legal ramifications because refugees can receive special protection as they can no longer depend on the protection of their own country of nationality.¹⁴

Security Missions

A country decimated by a disaster may not have the capability to provide the necessary security to distribute aid. Security missions involve establishing and maintaining the conditions necessary to provide humanitarian assistance by organizations of the world relief community. Threats from the local population may mean that the successful delivery of relief supplies depends heavily on the protection of several aspects of a relief operation: transportation routes, warehouses, airports, seaports, personnel, and dislocated civilian shelters. When airmen conduct security missions, they should realize that once the lift of relief supplies begins, secure areas will be needed for the storage of relief materiel.¹⁵

Technical Assistance and Support Missions

Technical assistance and support missions refer to short-term tasks in a humanitarian mission that are of a technical nature, such as communications restoration, relief supply management, provision of emergency medical care, demining, and high priority relief supply delivery. The military may provide this assistance in the form of advice, selected training, assessments, manpower, and equipment. In foreign operations, the force commander should establish policy regarding technical advice and assistance (what assistance may be provided, as well as the source of authority for assistance) to the affected country and relief recipients as soon as possible.¹⁶

Consequence Management Missions

Consequence management missions mitigate the results of an intentional or accidental release of a weapon of mass destruction such as chemical, biological, radiological, nuclear materiel or high yield explosives. The mission may include providing transportation, communications, public works, fire fighting, information planning, care of mass casualties, resources support, essential or routine health and medical services, urban search and rescue, hazardous materiel, food, and energy.¹⁷

Humanitarian and Civic Assistance Missions

In contrast to other forms of humanitarian assistance (HA) which involve emergency relief, the Air Force conducts humanitarian and civic assistance (HCA) as part of a long-term planned program of nation assistance. HCA operations may require logisticians to support medical, dental, veterinary care, construction of rudimentary surface transportation systems, well drilling and construction of basic sanitation facilities, and repair of public facilities. Federal law (Title 10 USC, Section 401) concerning HCA states the following.

- Must be carried out in conjunction with host nation (HN) military and civilian personnel

- Shall complement and may not duplicate any other form of social or economic assistance provided to the host nation by another department or agency of the US
- May not be provided directly or indirectly to any individual, group, or organization engaged in military or paramilitary activity
- May not be provided unless the DoS specifically approves such assistance¹⁸

Coordinating Organizations

International Relief Community

- **Nongovernmental Organization (NGO).** NGOs are private, self-governing, not-for-profit organizations dedicated to alleviating human suffering. They promote education, health care, economic development, environmental protection, human rights, and conflict resolution. They also encourage the establishment of democratic institutions and civil society.¹⁹ Examples of NGOs include Oxfam International and Doctors without Borders.²⁰
- **International Organization (IO).** IOs are organizations with global mandates and are generally funded by national governments.²¹ Examples of IOs include UN agencies and the International Committee of the Red Cross (ICRC).²²
- **Private Voluntary Organization (PVO).** PVOs are tax-exempt, nonprofit organizations working in, or intending to become engaged in, international development activities. PVOs receive revenue from the private sector and voluntary contributions from the general public. Examples of PVOs include Catholic Relief Services and Save the Children.²³

The President and the National Security Council

Through the National Security Council, the President establishes US national security policy, which is then implemented by the agencies under his command. In addition, the Stafford Act states that the federal government must assist state and local governments in alleviating the suffering and damage resulting from major disasters and emergencies. Once the President declares a major disaster or emergency under this act, he may direct any agency of the federal government to undertake missions and tasks (on either a reimbursable or nonreimbursable basis) in support of state and local agencies.²⁴

Department of Homeland Security

The Department of Homeland Security (DHS) leads the unified national effort to secure America by preventing and deterring terrorist attacks and protecting against and responding to threats and hazards to the nation.²⁵ Within the DHS, the Federal Emergency Management Agency (FEMA) has the mission of

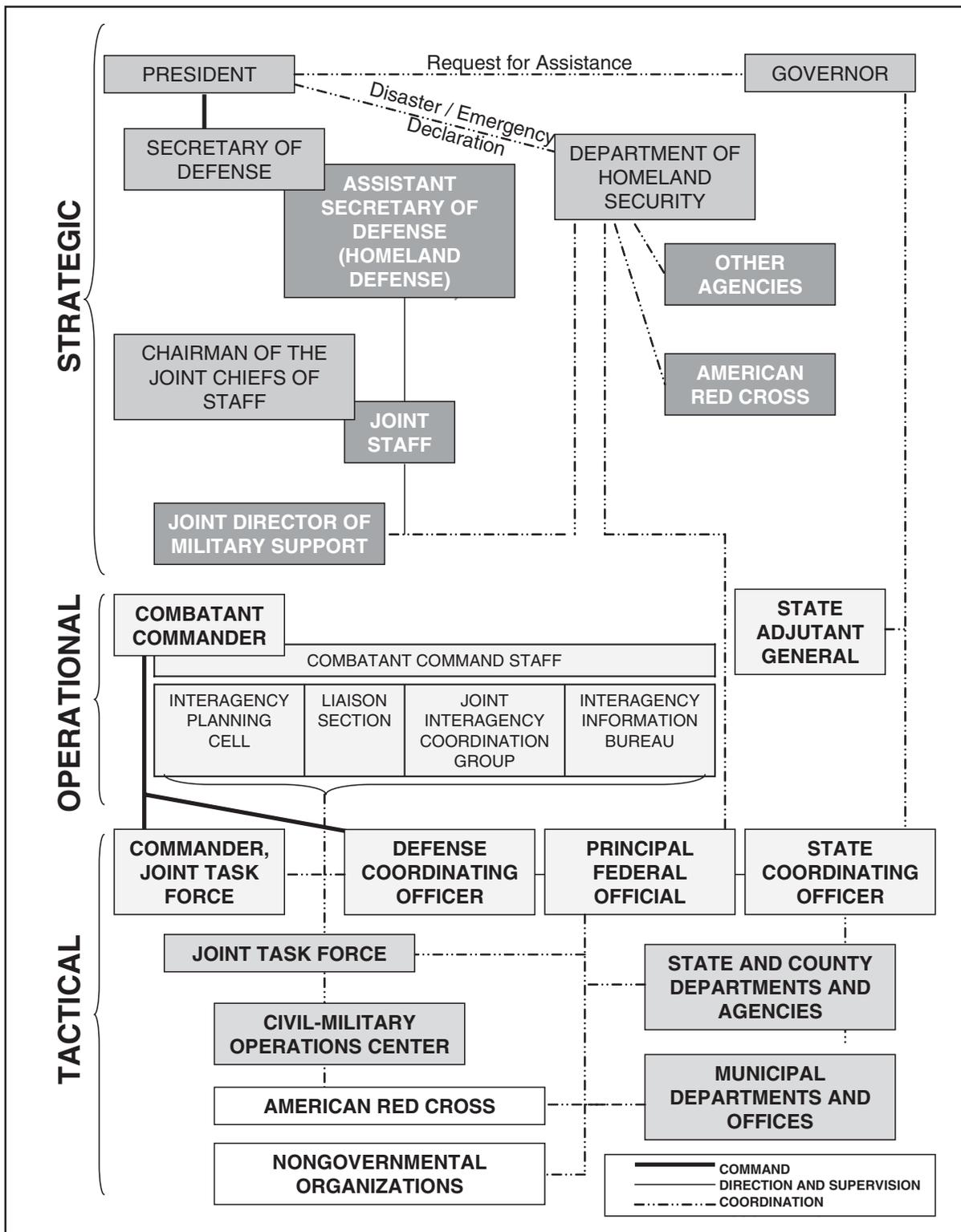


Figure 1. Model for Coordination Between Military and Nonmilitary Organizations - Domestic Civil Support ³⁰

leading the effort to prepare the nation for all hazards and effectively managing federal response and recovery efforts following any national incident.²⁶ FEMA sets up a disaster field office (DFO) in or near a disaster area to coordinate federal recovery activities with state, local, and DoD emergency management officials.²⁷ See Figure 1 for a sample chart that illustrates relationships.

Department of State

In US foreign HA operations, the ambassador within the affected country has overall responsibility for coordination. The Office of Foreign Disaster Assistance (OFDA) and its parent organization, the US Agency for International Development (USAID), assists the embassy in coordinating and conducting operational assessments. Depending on the nature of the situation, OFDA may request logistics support, via the Secretary of State and the President, from the DoD. If the President approves the use of the DoD in support of the OFDA request, the regional combatant commander will provide military assistance.

OFDA. An agency within USAID, OFDA coordinates the total USG response to foreign disasters, performing needs assessment, and initiating necessary procurement of supplies, services, and transportation.²⁸ OFDA works closely with the international relief community, and OFDA has the authority to coordinate with the DoD. OFDA can deploy a disaster assistance response team (DART) into the crisis area to assist the HA coordination team.²⁹

Logisticians should coordinate military interactions with NGOs and PVOs via the US country team, particularly OFDA DART representatives.³¹ The *OFDA Field Operations Guide for Disaster Assistance and Response* provides useful information on transportation, communications, food, water, sanitation, emergency health treatments, and shelter parameters.³²

OFDA Coordination. To accomplish its mission, USAID/OFDA works closely with many NGOs, PVOs, and IOs: ICRC, International Federation of Red Cross (IFRC) and Red Crescent Societies, United Nations Department of Humanitarian Affairs (UNDHA), UN Children's Fund, and United Nations World Food Program. OFDA also coordinates meetings with other governments responding to disasters to resolve operational and political problems. Because OFDA funds other relief organizations, OFDA may have the ability to expedite interventions in numerous ways.³³

Department of Defense

The Combatant Commander. The combatant commander (COCOM) has the responsibility to develop the strategic objectives required to transform national strategic policy and guidance into operational level activities for the HA crisis. To aid in the development of the HA plan, the COCOM may organize and deploy a humanitarian assistance survey team (HAST) to the operational area to acquire necessary intelligence. The COCOM may also create additional offices at his command to handle the extra requirements of an HA mission. These offices include a humanitarian assistance coordination center (HACC), a logistics readiness center, and a liaison section. The COCOM may determine that further augmentation of forces with additional personnel is necessary. See Figure 2 for a sample chart that illustrates coordination relationships. Finally, the COCOM may determine that the HA operation requires the creation of a Joint task force (JTF). The JTF may work together with allies or foreign forces in a combined or multinational effort.³⁴ For more information on employing Joint forces, see JP 3-07.6, *Joint Tactics, Techniques, and Procedures for Foreign Humanitarian Assistance*.

Humanitarian Assistance Survey Team. The HAST deploys to the area of responsibility (AOR) to assess existing conditions

for the operation plan development. Before deploying, the HAST should receive a current threat assessment, current HA operations intelligence, geospatial information and services support, and embassy and DoS points of contact. The senior deploying commander should ensure that a pre-deployment vulnerability assessment has been conducted. The DoS DART and USAID mission can provide a great deal of this information. This topic is explained further in JP 3-07.6, *Joint Tactics, Techniques, and Procedures for Foreign Humanitarian Assistance*.

The HAST may have many responsibilities that include:

- Conducting reconnaissance to assess:
 - Available logistics facilities
 - Significant actors
 - The food and water supply
 - Loss of life, injury, and illness
 - Number of displaced persons
 - Disruption of the government
 - Presence of medical representatives
 - Status of communications and facilities
 - Destruction of property and infrastructure
- Establishing liaisons and coordinating assessments with host nation agencies, supported commanders or their representatives, US diplomatic personnel, and other relief agencies
- Formulating recommendations on HA missions and desired capabilities
- Coordinating with the United States Transportation Command (USTRANSCOM) in arranging for the reception of US personnel, supplies, and equipment
- Beginning HA missions to relieve suffering and life-threatening situations in emergency cases
- Determining the threat environment and surveying facilities capable of being used for self-defense of forces³⁶

Humanitarian Assistance Coordination Center (HACC).

Normally a temporary body, the HACC assists with interagency planning and coordination. The HACC links governmental and nongovernmental agencies participating at the strategic theater level with the combatant command. If the HACC operates beyond the early planning and coordination stages, it normally becomes integrated into the JTF humanitarian operations center (HOC). Staffing of the HACC should include the following personnel.

- HACC director
- NGO advisor
- Civil-military operations planner
- OFDA advisor or liaison (if available)³⁷
- Legal advisor
- Public affairs officer
- Other augmentation as required³⁸

Logistics Operations Center. For the COCOM, the logistics operations center (LOC) serves as the point of contact for implementing a timely and flexible logistics response to an HA emergency. The LOC, if formed, serves to track and manage logistics needs of coalition forces while also coordinating

Chapter 2 - Operational Environment

logistics management and flow with other agencies in the operation. LOC responsibilities include management of the following:

- Alert key logistics agencies
- Locate and release required supplies
- Direct movement of supplies to departure airfields and seaports of embarkation
- Direct delivery of supplies and equipment to required locations
- Coordinate types of supplies and arrival times with other US and foreign agencies (often conducted by airlift in the early stages of response)
- Plan and coordinate aspects of force deployment and sustainment³⁹

Liaison Section. In conjunction with US operations, other nations might deploy military forces to operate with the JTF. Some coalition units may provide liaison elements at the COCOM as well as the JTF level.⁴⁰

Augmentation. It may be beneficial to augment the JTF with a group of experts from the COCOM staff. The COCOM may also tailor a deployable Joint task force augmentation cell (DJTFAC) to complement the JTF. A DJTFAC consists of experts in communications, coordination, logistics, planning, and public affairs.⁴¹

Defense Coordinating Officer (DCO). In domestic humanitarian assistance, United States Northern Command (USNORTHCOM) designates a defense coordinating officer (DCO) to coordinate DoD support to civilian agencies through the federal coordinating officer or principal federal official (PFO) at the disaster field office (DFO).⁴² United States Army North (USARNORTH), the Army component command of USNORTHCOM, has been tasked to support domestic civil authorities missions. As such, USARNORTH coordinates the activities of DCOs and their elements, which are assigned in each FEMA region.⁴³

Joint Interagency Coordination Group (JIACG). The Joint Interagency Coordination Group (JIAG) is an interagency staff group that establishes regular, timely, and collaborative working relationships between civilian and military operational planners. Composed of USG civilian and military experts accredited to the combatant commander, the JIAG gives the COCOM the capability to collaborate at the operational level with other USG civilian agencies and departments. The JIAG complements the strategic level interagency coordination that takes place through the National Security Council.⁴⁴

The Joint Task Force. The JTF provides personnel, equipment, and supplies to a disaster area. In domestic HA, the JTF works through the DCO to identify tasks, generate forces, prioritize assets against requirements, assist federal and private agencies, provide disaster response at the DFO, and support the local government based on FEMA mission assignments. It may be determined that, to eliminate duplication of effort and conserve scarce resources, a JTF should establish a Joint task force support command (JTFSC), Joint facilities utilization board (JFUB), and a Joint movement center (JMC). To coordinate the humanitarian relief effort, the JTF will likely create a civil-military operations center (CMOC) and, in foreign humanitarian assistance (FHA), contribute personnel to a humanitarian operations center (HOC).⁴⁵

Joint Task Force Support Command (JTFSC). The JTFSC facilitates the process of setting theater logistics priorities. A JTFSC has a status as a separate JTF component (coequal to Air Force forces and Navy forces), which gives it the power to act as a broker between the other Services, thus improving overall efficiencies and economies of scale.⁴⁶

Joint Facilities Utilization Board. An HA operation can involve large numbers of coalition or US military forces potentially competing for real estate within the same geographical area. The JTF commander's logistics staff, J4, may form a Joint facilities utilization board (JFUB) in order to handle these issues most effectively. A JFUB acts as the executive agent to deconflict multiple user demands and recommend courses of action on unresolved issues pertaining to force accommodations, ammunition storage

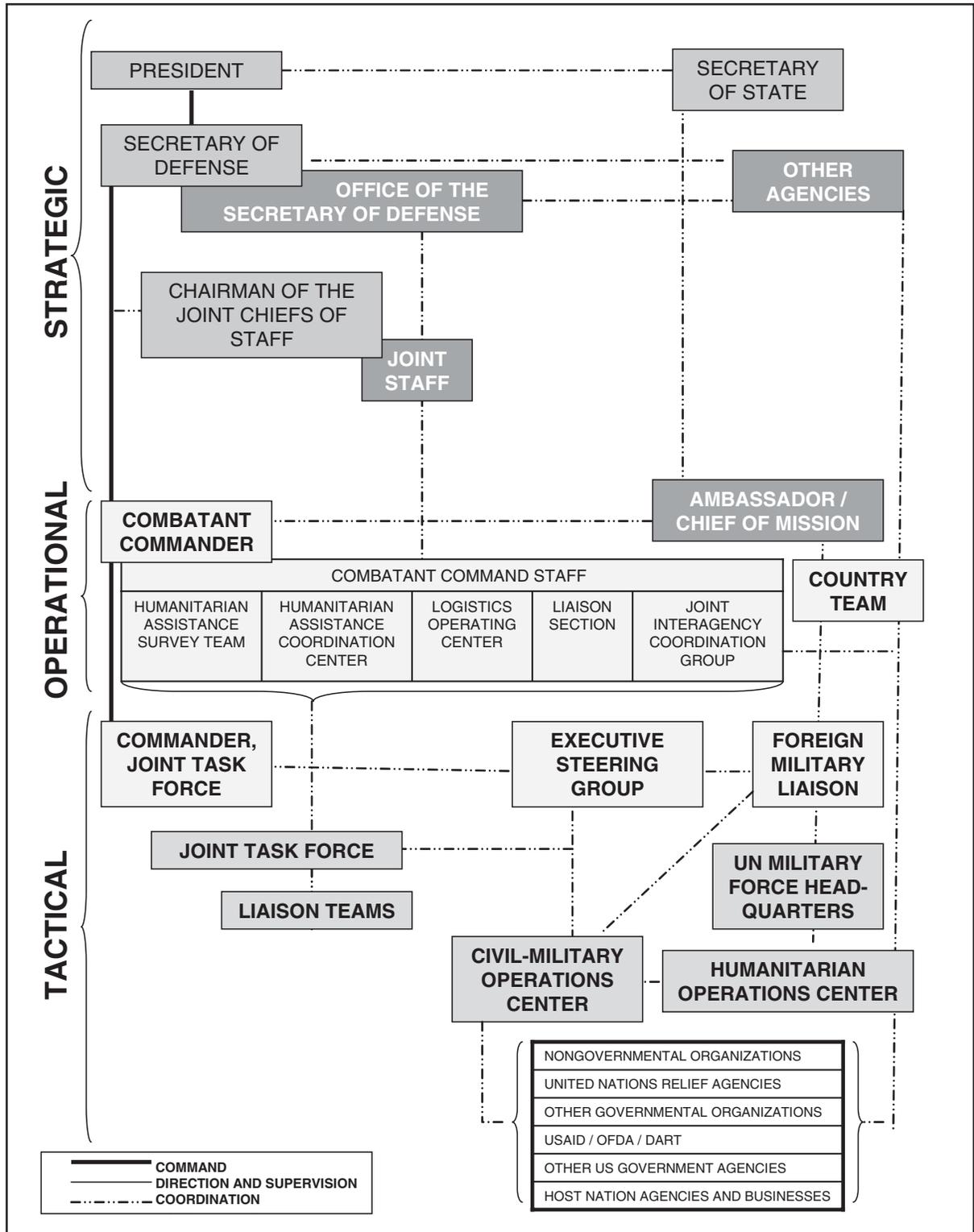


Figure 2. Model for Coordination Between Military and Nonmilitary Organizations - Foreign Operations³⁵

points, Joint visitors bureau, postal facilities, transit facilities, and so forth.⁴⁷

Joint Movement Center. The Joint movement center (JMC) coordinates the employment of all means of transportation (including transportation available from allies or host nations)

to support the concept of operations.⁴⁸ Created by the COCOM, the JMC usually falls under the staff supervision of the senior logistics staff officer, and it supports the JTF by coordinating transportation with USTRANSCOM. The JMC oversees the execution of transportation priorities, plans movement

Chapter 2 - Operational Environment

operations, monitors the overall performance of the transportation system, and coordinates immediate transportation requirements.⁴⁹

Civil-Military Operations Center (CMOC). An important element for the success of a humanitarian mission, the CMOC coordinates and facilitates US and multinational forces' humanitarian operations with the efforts of international and local relief agencies, HN agencies, and HN authorities. In FHA, the CMOC works closely with relief agencies and other organizations, and an OFDA DART facilitates the civil-military interface.⁵⁰ The CMOC's primary function is receiving, validating, and coordinating requests for assistance (RFA) (for airlift, sealift) from relief agencies such as NGOs and the UN. See Figure 3 for the RFA flow process and Table 1 for a list of potential CMOC roles and responsibilities. In daily meetings, the CMOC identifies elements of the JTF that can fulfill these requests for assistance. Given the CMOC's roles and responsibilities, communication capabilities should be carefully prioritized with the CMOC in mind.⁵¹ For the sake of their donors and beneficiaries, relief agencies should ideally be given the best possible asset visibility throughout the RFA process. See Figure 4 for a sample CMOC organizational chart.

Humanitarian Operations Center. Normally established by the UN or a relief agency, the HOC develops and coordinates the overall relief strategy. In doing so, the HOC identifies logistics requirements for NGOs, the UN, and IOs. The HOC then identifies, prioritizes, and submits requests for military support to the CMOC. The HOC acts as an interagency policymaking body that does not exercise command and control. Instead, it seeks to achieve unity of effort among all of the disaster relief participants (host nation, the military, NGOs, the UN, and so forth).⁵⁵ The commander of the JTF may contribute personnel to an HOC. The HOC typically consists of a UN director with deputy directors from the JTF and OFDA DART. Representatives from the relief organizations form the standing liaison committee—the policymaking body of the HOC. HOC core groups and committees discuss ways to resolve issues on topics such as medical support, agriculture, water, health, and education.⁵⁶ See Figure 5 for a sample HOC organizational chart.

Types of Environments

In collaboration with other responding organizations, the US force commander assesses the operational environment with regard to the political situation, physical boundaries, threat to forces, global visibility, and media interest. This assessment will determine logistics requirements as they relate to the threat; however, airmen should remain watchful, as the HA environment can rapidly change.⁵⁸ Logisticians should never assume that even the most permissive looking environment will remain as such.⁵⁹ For

Screen, validate, and prioritize (based on DART advice) NGO, UN, and IO military support requests
Coordinate NGO, UN, and IO military support requests with military components
Act as an intermediary, facilitator, and coordinator between JTF elements and NGOs, UN, and IOs
Explain JTF (military) policies to NGOs, UN, and IOs, and explain NGO, UN, and IO policies to the JTF
Respond to NGO, UN, and IO emergency requests
Screen and validate NGO, UN, and IO requests for space available passenger airlift
Administer and issue NGO, UN, and IO identification cards (for access into military controlled areas)
Convene ad hoc mission planning groups when complex military support or numerous military units and NGOs, UN, and IOs are involved
Exchange JTF operations and general security information with NGOs, UN, and IOs, as required
Chair port, rail, and airfield committee meetings for space and access-related issues
Assist in the creation and organization of food logistic systems, when requested
Provide liaison between the JTF and HOC
Explain overall interagency policies and guidelines to the JTF and NGOs

Table 1. Potential CMOC Roles and Responsibilities⁵³

example, after Hurricane Katrina struck New Orleans, the civilian population began firing weapons at military search and rescue teams. Logisticians should plan for the possibility of conflict since desperate beneficiaries can become belligerent.

Permissive Environment. In a permissive environment, commanders expect little or no opposition or resistance for the HA forces. A permissive environment promotes effective logistics in HA operations. Failure to distinguish between a permissive and hostile environment will result in inadequate planning and unrealistic expectations.⁶⁰ In a permissive environment, the host country military and law enforcement agencies have the control, intent, and capability to assist humanitarian assistance operations.⁶¹

Uncertain Environment. In an uncertain environment, host government forces do not have total control of the territory and population in the intended area of operation. The host nation government may also be either opposed or receptive to the HA operations.⁶²

Hostile Environment. In a hostile environment, hostile forces have control and the intent and capability to effectively oppose or react to operations a unit intends to conduct, and military forces must prepare to operate in a full range of force protection contingencies.⁶³ The Air Force may conduct HA operations in a hostile environment in which the conditions, circumstances, and influences range from civil disorder or terrorist actions to full-scale combat. Logisticians must prepare for different and additional logistical needs that might result from a full range of contingencies such as defending the perimeter, providing escort convoys, screening the local populace, and assisting in personnel recovery operations.⁶⁴

A hostile environment possesses the following characteristics.

- Multiple conflicting parties.
- Imminent danger to all parties.
- Relief materiel used by combatants for political gain or social manipulation.
- Mission creep may divert resources from HA to combat service support.⁶⁵

Organizational Arrangements

The Air Force may participate in HA operations coordinated by the UN, a multinational coalition, or the US (unilaterally). Each of these arrangements can have important implications for Air Force logisticians. For example, the availability of funding sources or transportation assets may be unusual or unique. In any arrangement, civil-military relationships may very well serve as the critical enabler to mission success.⁶⁶

United Nations Coordinated Organizations

UN coordinated organizations refer to responses specifically organized and executed by UN forces.⁶⁷ Since the end of the Cold War, the UN has become more involved in worldwide HA missions. The UN may supply military forces for security and

monitoring of HA missions (as in the case of Somalia). While working toward a political consensus, the UN may respond slowly to a crisis, making a coalition or unilateral response faster. As a result, the US may begin an HA operation (in a unilateral or multinational command structure) and then turn it over to UN personnel.⁶⁸

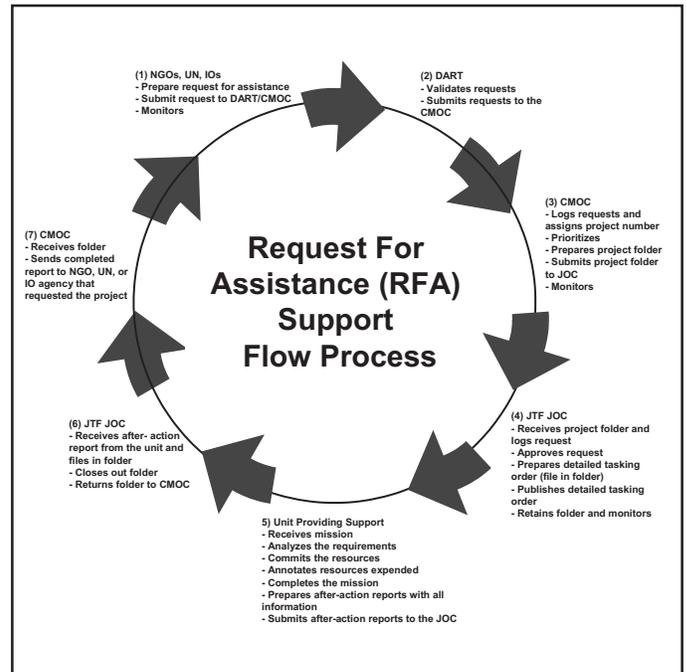


Figure 3. Sample Request for Assistance Support Flow Process⁵²

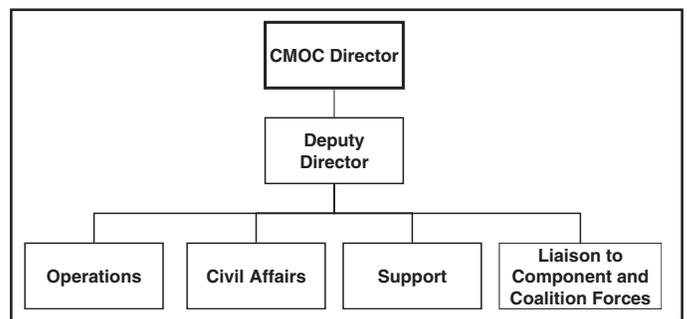


Figure 4. Sample CMOC Organization⁵⁴

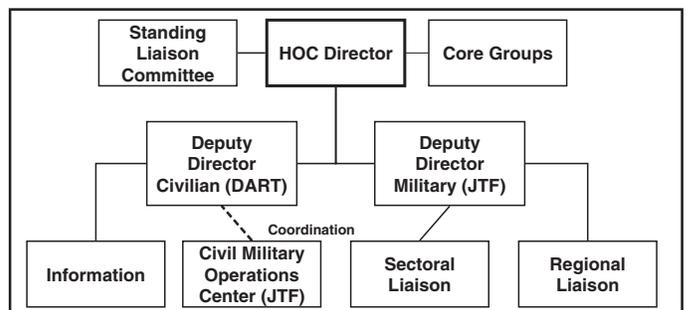


Figure 5. Humanitarian Operations Center Organizations⁵⁴

Chapter 2 - Operational Environment

Multinationally Coordinated Organizations

Multinationally coordinated organizations involve military forces and civilian agencies from more than one nation. There are three potential command relationships—lead nation, parallel, and regional alliance. In the lead nation option, the HA partners work under the command of a single nation. In the parallel option, multinational partners retain greater control of their own forces. In the regional alliance option, existing alliances form the basis for the forces.⁶⁹

Multinational operations usually coordinate large-scale HA responses. In these arrangements, clearly defined command relationships can determine the success or failure of the logistics response as well as the entire operation. Political goals of contributing nations can affect the command and control structure.⁷⁰

Multinational HA logistics possesses unique and difficult challenges for coordination. These challenges include language translation, cross-cultural sensitivities, and national perspectives. In multinational-led operations, planning should stress the establishment of essential liaison personnel.⁷¹ Traditional military rivals may have to cooperate, and language barriers may complicate matters. Extensive liaison support with partners (for example, NGOs, IOs, PVOs, as well as involved nations) will help reduce cultural barriers.

Unilaterally Coordinated Organizations

In unilateral operations, the US military works with the host nation in providing HA without the direct involvement of any other nation. A unilateral operation would normally occur when the mission requires expediency, as in the case of providing immediate airlift following a natural disaster. Unilaterally coordinated organizations may transition to become multinationally led organizations.⁷² In unilaterally coordinated operations, the US military will likely work in concert with other US government organizations such as USAID and FEMA.

For virtually every large-scale operation, more than one military service participates under a JTF organization. It should be remembered that within this JTF each Service possesses unique capabilities and capacities, which can vastly improve the overall response. For example, Operation Unified Assistance and Joint Task Force Katrina

Increase Awareness and encourage contact between the military and NGOs and IOs through symposia, meetings, briefings, and joint planning sessions.
Incorporate selected NGO and IO training into Service and joint training programs, and incorporate military training into NGO and IO training.
Review lessons learned in joint and Services' lessons learned databases.
Remember that NGOs and IOs may perceive the military as an inexhaustible resources reservoir thereby inundating the military with requests.
Many relief agencies may interpret equivocal responses such as "we'll try" as an affirmative response. Inability to provide support may adversely affect the civil-military relationship.
Be aware that not all NGOs and IOs appreciate military assistance or intervention.
Clearly articulate the role of the military and how it intends to interact with NGOs and IOs.
Recognize legal requirements and regulations that apply to relationships with NGOs and IOs.
Ensure that agreements and memorandums of understanding fully address funding considerations, delineate authority, and define negotiation channels.
Exchange NGO, IO, and military unit operating procedures and capabilities.
Ensure that CMOC officers are not perceived as favoring a particular relief organization, particularly at the expense of other organizations.
Consider acquiring a LNO from the NGO and/or IO community to be a part of the US force staff to help with such duties as coordination and planning.
Post information on the UN's ReliefWeb Internet site. The website is widely used by NGOs, IOs, and others to share and coordinate information.
Share logistic database information.

Table 2. Recommendations for Strengthening Civil-Military Unity of Effort ⁸⁰

benefited greatly from the other Services' ships, hovercraft, helicopters, and engineering personnel.⁷³

A single military service may also conduct HA operations and must therefore be capable of operating in a Joint, multinational, or interagency scenario. Furthermore, small units may serve as first responders and precursors to large-scale HA operations. Small-unit operations may include tasking of individual units for emergency medical support or short-term deployments of aircraft and personnel for quick-reaction transportation capabilities.⁷⁴

Civil-Military Partnerships

Significance

Mutually beneficial partnerships between the military and civilian organizations can substantially impact the success of the US military mission. In HA operations, the US military's role is to enable civilian agencies to perform their tasks.^{75,64} The Secretary of Defense may task US military forces to work closely with civilian organizations such as the UN, NGOs, and IOs. Creating an organizational framework for structured civil-military interaction, such as a CMOC, permits the military and civilian organizations to meet and work together while advancing common goals. It is crucial to remember that the role of such missions should be to enable, not perform, tasks.⁷⁶

The military should work closely with civilian organizations, especially with respect to logistics. The UN, NGOs, and IOs perform their own logistics assessments, and civilian organizations may have begun operating in the area long before the military arrives. These factors mean that civilian relief organizations may serve as excellent sources of information on the HA situation and challenges (defining food, water, and transportation requirements). Furthermore, the humanitarian relief community typically provides the bulk of the direct HA distribution at the grassroots level to the host populations, and NGOs and IOs will provide HA in areas of high risk, where other organizations will not go. Finally, the timing of termination may also depend upon successful transitioning of coordination to civilian relief agencies.⁷⁷

Coordination with Civilian Relief Agencies

Despite the need for a close working relationship, a unified civil-military partnership can be difficult to attain. Coordination with relief organizations is challenging. For example, civilian aid organizations frequently do not employ a rigid chain of command. They usually favor a decentralized organization. Secondly, NGOs, IOs, and the UN may not fully appreciate military assistance in HA operations. Aid workers may not understand or may be confused about the nature and motives of the responding military force. In addition, civilian relief organizations often have neutrality mandates that prevent them from collaborating with armed forces. These neutrality mandates help prevent their beneficiaries from

inadvertently viewing the aid organizations as adversaries. Making matters even more challenging, numerous organizations can become involved in the relief effort, which can inherently undermine unity of effort.⁷⁸

Considering the many challenges of coordinating with civilian relief agencies during HA, relationships with these organizations need to be based on a mutual understanding in areas concerning lines of communications, support requirements, procedures, information sharing, capabilities, and most importantly, missions. The American Council for Voluntary International Action, a consortium of over 150 private agencies operating in 180 countries, can facilitate coordination. The UN Office for Coordination of Humanitarian Affairs can also help with coordination efforts.⁷⁹ Finally, Table 2 lists specific recommendations to help strengthen the unity of effort.



New Orleans Residents Evacuate During Hurricane Katrina

Chapter 3 - Logistics Considerations

Often, HA operations demand creative and nontraditional logistics solutions to unique problems. Logistics support during HA needs to be responsive and effective while at the same time having a reduced *footprint* of forward-deployed logistics elements. Emphasis on compact and multiuse equipment, increased dependability, less redundancy, and the ability to reliably reach back for support are all central to effective logistics.⁸¹

Lessons learned indicate that logistics requirements in foreign humanitarian assistance are frequently underestimated. As a result, care should be taken throughout the operation that the overall logistics concept is closely tied to the operational strategy and that logistics and operations elements are mutually supportive.⁸²

Operational Level Considerations

Open the Base

Funding Authority. Funding the logistics of an HA operation can quickly become one of the most significant challenges for commanders. Expenses accrue rapidly, and commanders must therefore address the legal authority, mechanisms, and constraints that affect the Air Force in acquiring and disbursing supplies and services.

The Air Force normally receives reimbursement for expenses in HA missions as long as certain criteria are met. Refer to AFI 10-802, *Military Support to Civil Authorities*, for specific guidelines and legal criteria.

USAID/OFDA coordinates payment of such expenses when it requests DoD actions; however, the DoD must coordinate with USAID/OFDA in advance of any funds expenditures. Without prior USAID/OFDA coordination (or if Air Force costs exceed USAID/OFDA resources), replacing resources requires congressional action.

Logistics Assessments. Logistics assessments during HA operations require an integrated approach including host nation and theater support capabilities. Assessments should include inputs from the civilian relief community. When operating in remote and austere locations, the deployment of materiel handling equipment and communication assets becomes a high priority. Area assessments, or studies, serve as a key element in planning the logistics in HA operations. Area assessments include information about the area of operations such as logistics, politics, culture, economy, geography, and weather. Area assessments should attempt to focus on the underlying causes of problems. Information obtained from news agencies can also be a valuable source of intelligence.

Pre-Deployment Planning Considerations.⁸³ Identify time-phased materiel, resources, facilities, and other resources necessary to support the current operation. Establish thorough

methods to identify and prioritize cargo increments, especially non-DoD cargo, to ensure transportation control.⁸⁴

- Determine logistics planning factors to be used for the operation and development of logistics requirements. Additionally, define the method to determine sources for all classes of supply.
- Identify support methods and procedures required to meet the air, land, and sea lines of communication.
- Provide for coordinating and controlling movements in the HA area of operations to adjust the materiel flow commensurate with the throughput capability.
- Describe the interrelationship between theater and strategic LOCs, to include the need for airfields capable of supporting strategic and theater airlift aircraft. Develop a country or theater concept of support.
- Develop a plan to provide food, equipment, and medical supplies to relieve suffering in the absence of NGOs, PVOs, and IOs.
- Airmen in logistics roles should also prepare for and remain aware of cultural differences integral to international HA. Airmen should avoid imposing ethnocentric standards on a group that resists these standards. For example, airmen may encounter cultures that may refuse certain types of food, even in disaster situations.
- The COCOM J4 should consider contracting for support capabilities to resolve critical supplies, services, and real estate concerns. Contracting support can come from within the host nation or from outside the country. If support is contracted from inside the country, the country logistical resources should be able to support the country first and then the military requirements.
- Security of personnel, supplies, and equipment is paramount. Plan in advance for the worst-case scenario during warehousing and distribution.⁸⁵

Locating Logistics Bases. Factors such as safety and security may significantly affect the location of logistics bases. However, military leaders should attempt to establish logistics bases as close as possible to the relief recipients.⁸⁶ Close proximity of logistics bases creates numerous benefits such as faster and more accurate assessments and reduced lag time in distribution of supplies. In addition, close proximity of logistics bases can help prevent population movements that might diminish the social and economic support systems of the beneficiaries.

Command and Control

Commander's Principal Concerns. The following outlines key concerns.

- Do not make the problem worse. Initial groups of personnel should be self-sustaining (have food, water, medical, and shelter) to last until either military support units arrive or

commercial services resume. All combat service support areas of the responding unit must be considered (supply, transportation, maintenance, general engineering, health services, and services).

- Publicize the desired end state to all participants early to avoid unreasonable expectations and mission growth.⁸⁷ Have a transition plan. Include the intended scope and duration of military involvement.
- Civilian organizations should contribute to the operation with all available assets as they arrive in the AOR, facilitating rapid transition away from reliance on military aid.⁸⁸
- Commanders should keep careful control over personnel to provide accountability and safety. For additional considerations, see Table 3.⁸⁹

Organizational Preparedness. Commanders must prepare forces for unique HA operations, and they must also anticipate equipping and training needs. In-theater precrisis training and periodic training directly enhances HA operational effectiveness. The command and control organization, especially logisticians, must prepare to coordinate with many nonmilitary groups including the OFDA, part of the USAID that manages foreign disaster assistance; FEMA, part of the DHS that manages domestic disaster assistance; and UN agencies (the Office for the Coordination of Humanitarian Affairs, World Food Programme, PVOs, NGOs, and IOs).

The success of the logistics and overall HA operation depends heavily on effective situational awareness from information and intelligence sources. The command and control organization must additionally prepare for the challenges involved in gathering, processing, and disseminating information in an HA environment.

Media Coverage.⁹⁰ Airmen should anticipate extensive media coverage of HA operations. Commanders at all levels, government agencies, the public at large, and others may use media reports to gauge the success of the mission. Airmen should facilitate media coverage, through the public affairs officer, to the maximum extent possible. Media events can assist the HA

Visa requirements
Border crossing points
Customs clearance of staff carrying specialized equipment
Legal status of personnel
Arrival times clearly designated as GMT (zulu) and local time
Compatible communications equipment between HQ and field
Security situation, evacuation plans, and personnel accountability

Table 3. Personnel Considerations

Chapter 3 - Logistics Considerations

mission and support US national objectives. Airmen involved in HA logistics should not seek to control the media, but instead to understand the impact supporting the media will have on HA operations. For example, media personnel may supplant intended cargo space for relief items. Planning in advance for these additional logistics demands can ensure that operational objectives are still met.

Tactical Level Considerations

The tactics, techniques, and procedures outlined below are intended as a guide for planning and execution of HA activities. They are not all-encompassing, and should be used as a starting point. See Appendix E for a list of publications that specifically address HA activities.

In general, two questions will dictate the scope and magnitude of operations:⁹¹

- What is preventing people from obtaining aid from traditional sources?
- What are the needs of the population that only the military can satisfy?

Establish the Base

- Logistics planning, command, and control.
 - Emphasis must be placed upon locating logistics bases as close as possible to the recipients. Logistics planners should avoid locating distribution points in major population centers to reduce the influx of affected populations from outlying, traditional economic and social areas.⁹²
 - Planning must include logistics support that normally is outside the bounds of military logistics, such as support to the civilian populace (women, children, and the aged). Civil-military operations forces often are going to provide support for these categories of individuals. Planners must take appropriate steps early on to ensure proper aid is administered.
 - Planning should consider the potential requirements to provide support to nonmilitary personnel, such as NGOs and international organizations.
 - Clearly identify higher commander's specified and implied tasking.⁹³
 - Begin communications with other responders.⁹⁴
 - Establish a 24-hour command and control hub.
 - Quickly develop a network of contacts with functional counterparts.
 - Utilize media outlets and public affairs functions.⁹⁵
 - At the earliest opportunity, obtain host nation permission to operate aircraft and watercraft.
 - Determine what information is vital, what method is best to obtain this information, and how much detail is necessary for it to be useful.⁹⁶
 - Gather intelligence and analyze: political, legal, military, and cultural limitations; physical (topographical, infrastructure) obstacles; manpower and materiel as part of the total response force (manpower and materiel may include other Services, agencies, host nation, and NGOs); and information or capability gaps that may be critical to mission success. In addition, other organizations may be able to provide additional intelligence. Scrutinize the source and quality of data to prevent inflated requests⁹⁷ and to ensure relevance to the operation. Determine whether it is part of the emergency or a chronic need.⁹⁸
 - Determine primary and alternate fuel sources.⁹⁹
 - Review lessons learned for other similar operations.¹⁰⁰
 - Military response to humanitarian crises is very similar to other short-notice deployments. Refer to the *Agile Combat Support Concept of Operations* for more information on the building block approach to operations.¹⁰¹
 - Seek out subject matter experts from recent operations or exercises.¹⁰²
 - Other responding organizations (OFDA DART, UN, IFRC, and others) may have information you can use to boost situational awareness. Tapping into their networks may save valuable time and effort (data quality may be an issue).¹⁰³

- Give special consideration to employing units which can *jump-start* the supply pipeline or provide unique capabilities other organizations cannot provide (search and rescue, chaplain, mortuary affairs, and others).¹⁰⁴

Generate the Mission

Contracting can be an effective force multiplier of combat service support for deployed forces. Logisticians should be thoroughly familiar with contracting options available through the Navy's Emergency Construction Capabilities Contract Process, the Army's Logistics Civilian Augmentation Program, the Air Force Contract Augmentation Program, acquisition cross service agreements, or HNS resources. Contracting can bridge gaps that may occur before sufficient organic support units can deploy, or it can be used to reduce the logistics footprint. Above all, military forces should not compete for scarce civilian resources.¹⁰⁵ The COCOM LOC deconflicts multiple requirements for contracts.

Logisticians should consider all potential sources of supplies. Sources may include the affected country, commercial, multinational, and prepositioned supplies.¹⁰⁶ Materiel and equipment should be purchased or leased as close to the affected country as possible to reduce the cost of transportation and the time needed for delivery. Items not available in country should be purchased from neighboring countries in an *expanding ring* around the affected country. Heavy construction equipment and other vehicles should be leased whenever possible.¹⁰⁷

- The primary role of military contracting personnel is to provide supplies and services for military units, not for the affected population.
 - Other organizations are better suited to providing standardized, acceptable aid through their previously established supply chains.
 - Without precise specifications and advice from assessment teams, the wrong items and services could be purchased.
- Develop a means to write, approve, and fund contracts expeditiously.
 - Contracts should be written to facilitate easy exit of military forces and emphasize short-term transition to follow-on organizations.
 - Ensure currency requirements for customs and immigration fees are fully understood for all ports of entry into the host nation. Logistics expeditors mobilized to ports of entry must have immediate availability of all funds necessary to maintain an unrestricted flow of supplies, equipment, and personnel.¹⁰⁸
- Materiel and services should be purchased from local vendors.
 - Local vendor contracting eliminates international transport costs, conserves airlift and manpower, provides familiar goods to the population, boosts the local economy, and buys time for larger stocks to arrive.¹⁰⁹
 - Local and regional transporters and freight forwarders can be contracted to provide logistics services. They have valuable knowledge of local regulations, procedures, and facilities and can help ensure compliance with the laws of

the host country as well as expediting delivery operations.¹¹⁰

- Local points of contact, to include construction supervisors and freight forwarders, should have reasonable command of the English language, both spoken and written. Contacts at ports should immediately report all encountered delays to the transportation manager at the main operating location in order to speed resolution of any difficulties.¹¹¹ Make allowances for potential additional costs, errors, and delays if interpreters are employed.
- Ensure contracts include the following stipulations:¹¹²
 - Purchase contracts should provide for delivery-linked payments, the return of damaged goods, and penalties for any deviations in fulfillment of the contract, other than in situations of armed conflict.
 - Transporters and handling agents should assume total liability for food commodities in their care and reimburse any losses.
 - Ensure fair competition, transparency, and the utmost accountability when administering contracts.¹¹³
 - For more contracting considerations, refer to the *CARE Food Aid Logistics Operational Handbook*¹¹⁴ and the *World Food Programme Emergency Field Operations Pocketbook*.¹¹⁵

Operate the Base

- Supply
 - In cases where the Air Force plays a supporting role:
 - Storage areas for transient cargo should be:
 - Secured or limited access for accountability purposes.
 - Appropriate temperature for sensitive medicines or foods.
 - Protected from rodent and insect infestation.
 - Protected from fire or weather hazards.
 - Accessible for materiel handling equipment (MHE) to load trucks for onward disbursement.
 - Have communications capability for documentation and tracking.
 - Identify sources for pallets, tri-wall containers, packaging and banding, shrink wrap, cargo nets, and so forth.
 - Determine if personnel should be armed in the event that the host nation cannot secure warehouses or working areas.¹¹⁶
 - In cases where the Air Force is lead agency, take these actions in addition to supporting role duties:
 - Immediately request survival packs to include water source, food, blankets, plastic sheeting, and lumber based on initial area assessments.
 - Establish DoD activity address code for the site to enable financial mechanisms.
 - View Appendix A for more supply infrastructure considerations.
 - If necessary, refer to the *Air Force Refugee Camp Planning and Construction Handbook*.¹¹⁷ Since this

Chapter 3 - Logistics Considerations

activity is not a distinctive capability for Air Force units, seek combatant commander's guidance.

- Transportation
 - While airlift is an expensive distribution mode, it is good for delivering aid to remote, isolated populations or for high priority, time-sensitive cases.
 - Receiving prioritization guidance is key to managing port workload.
 - To conserve airlift for high-priority missions, utilize waterborne, road, or rail modes of distribution whenever possible.
 - Address problems with infrastructure and facilities impeding relief efforts.¹¹⁸
 - Calculate throughput limitations due to manpower and MHE. Request MHE as required to support operations and overcome limitations. Develop means to unload B-747, DC-10, and other high-door aircraft.
 - Plan on transporting supplies for the host nation, other agencies, and NGOs.¹¹⁹
 - Address any legal or security issues early in planning.
 - Seek guidance on how to prioritize cargo and passengers.
 - Integrate flight operations into existing air traffic control rules and routes. Establish and publish rules if none are in effect.¹²⁰
 - Carefully consider aircraft parking (especially tarmac weight limits) and cargo storage capability of airfields when requesting or scheduling aid.
 - Taskings for distinguished visitors and media transport may affect available aircraft.¹²¹ Often an additional aircraft will be kept on standby, which initially reduces the fleet, but may prove useful in last-minute taskings.
 - Distinguished visitors often travel with an entourage of security, support staff, and associated baggage. Media will carry bulky equipment, particularly after large-scale disasters. Weigh the benefits of using aircraft for these missions versus relief missions and plan accordingly.
 - Carefully screen for hazardous materiel in donated shipments.
 - Carefully document shipments via bills of lading and waybills through the chain of custody.

Improper packaging
Congestion at the port of entry and other nodes
Customs delays due to inadequate documentation
Theft and pilferage
Losses due to inadequate storage or inadequate protective measures
Losses from lack of insurance coverage
Materiel handling delays
Competition for local transport assets
Bottlenecks in the transport system
Donated shipments arrive unmarked or lack a specific point of contact or consignee
Unexpected cargo arrives at the port and is consigned to the emergency services of the affected nation, which may or may not be capable of distributing it
The unrequested cargo may consist of inappropriate goods, promoting greater port congestion and diverting staff from important tasks to remove or dispose of it

Table 4 Potential Problem Areas ¹²³

Phase I. A UN command is established or the host nation government is prepared to begin assuming responsibility for relief missions.
Phase II. Staff elements of UN or host nation familiarize themselves with the mission, the relief effort, and general situation. The UN begins assuming duties and responsibilities of the JTF. Command and control is established and functioning.
Phase III. Commander of UN forces or host nation government able to assume functions of the JTF. All nonessential US forces are withdrawn from the area.

Table 5. Transition Plan Phases ¹²⁴



Deploying to Support Hurricane Rescue Operations

- Properly documented shipments help donor agencies maintain accountability of supplies delivered.
- Stress to contributors that accurate shipping information is crucial to customs clearance, including indications on which cargo increments will remain in the affected country.¹²²
- To the extent possible, document shipments and schedules via unclassified means to simplify communications with other responders.
- Have a control plan for shipments on 463L pallets to prevent losing pallets, nets, and dunnage.

See Appendix A and Table 4 for more transportation infrastructure considerations.

Transition and Termination

Transition consists of the transfer of responsibilities and functions such as logistics to another organization such as a component of the JTF, the host nation, or the UN upon meeting objectives and receiving authorization. A transition plan aids in identifying transition issues. A transition plan should include the organization of the forces, operating procedures, and any other transition recommendations and considerations for the transitioning parties.

The transition plan should identify task force organization, operating procedures, and transition recommendations and

considerations. In implementing the transition plan, the transitioning parties should discuss criteria for transferring operations. The plan should be unclassified, clear, and concise, without military jargon. One method of transitioning is by function. Another method is by locale. If possible, the transition process should be event-driven and not tied to calendar dates. For example, functions or areas would only transfer when a similar capability becomes available or is no longer needed. Procedures for transfer of equipment or supplies, either between components of the JTF or with the UN or host nation, must be determined. JTF planners must identify fiscal guidance, reconstitution of assets, and availability and use of operations and maintenance funds. To track the progress of the transition process, a series of criteria may be developed as illustrated by the Transition Plan Phases from Operation Restore Hope in Table 5.

Supplies and equipment left behind as a result of HA support operations must be in accordance with all applicable Federal laws and statutes relating to the donation or transfer of military articles and supplies. Consult legal counsel prior to any release of supplies and equipment.¹²⁵ Government property to be transferred to NGO or refugee groups after camp construction must be accurately inventoried, so its value may be computed and provided to the legal community for transfer documentation.¹²⁶

Visit the *Journal* online at: <http://www.afjma.hq.af.mil/lgj/Afjlhome.html>

Chapter 4 - Today's Logistics Challenge

While humanitarian assistance has increasingly become a required area of proficiency for the Air Force, leadership in this mission continues to remain highly challenging. In 2005, logisticians from Operation Unified Assistance stated that humanitarian assistance operations

presented extra challenges not typically found in combat as a result of the urgency of planning, ambiguous command and control, and difficulty in communicating with numerous organizations both inside and outside of the DoD. According to AFIT School of Systems and Logistics research, the most common



US Air Force C-17s Unloading Cargo for Humanitarian Support Operations



Meeting the Challenge of Humanitarian Assistance—Military and Civilian Responders Assist Evacuees

Lessons learned from recent humanitarian actions (including the Southeast Asian Tsunami and Hurricane Katrina relief operations) reveal the following.

- Poor coordination
- Lack of information sharing
- Inadequate education and training
- Inconsistent processes
- Logistical capacity limitations impeded the logistics responsiveness of military missions

Clearly, providing humanitarian assistance presents additional challenges for military logisticians, and today's Air Force logistician must prepare for these challenges.

Appendix A - Infrastructure Checklist¹²⁷

Airports

- Identify the airport being assessed
 - Name
 - Designator
 - Location
 - Elevation
- Describe the current condition of facilities
- Ascertain whether the airport is fully operational
- Obtain information on usable runway lengths and locations
- Determine whether taxiways, parking areas, and cargo handling areas are intact and can meet the anticipated demands of the operation
- Establish whether runway and approach lights are operating
- Specify which navigational aids are operating
- Describe available communications facilities
- Determine whether the terminal building is operating
- Check the availability and cost of aviation fuel, refueling vehicles, and total refueling capacity
- Find out if facilities exist for mandatory aircrew rest
- Explore whether the cargo handling area can be lit for night cargo operations
- Determine what cargo handling equipment is available, including fuel, and operators
 - Forklifts (number, capacity)
 - Scissors lift (capacity)
 - Cargo dollies (number)
 - Trucks with drivers and laborers for hand unloading
- Determine what startup equipment is available, including ground power units, fuel, and operators
- Describe maintenance operations (facilities, personnel, hours)
- Outline what storage is available:
 - Covered
 - At the airport
 - Off airport
 - How far away
 - Capacity and suitability for storage of foods or other perishables

Civil Aviation

- Find out whether arrangements can be made for prompt overflight and landing clearances
- Ascertain that the air controller service is functioning and hours of operation

- Explore having *no objections* fees or *royalty* fees waived or paid locally
- Find out if arrangements can be made to work around the clock, including customs
- Identify personnel to tally and document cargo when received and transshipped
- Ascertain if the host government will accept deliveries by means of military as well as civilian aircraft
- Describe security arrangements
- Determine what repairs and auxiliary equipment would be needed to increase airport capacity
- Determine if any local air carriers exist and their availability and rates

Alternative Aircraft

- Identify any usable airports or suitable helicopter landing sites in the disaster zone
- Determine the local availability and cost of helicopters or fixed wing aircraft
- Estimate capacity
- Identify the owners and agents
- Determine the availability and cost of fuel

Warehousing

- Identify undamaged or damaged but usable warehouses located in reasonable proximity to the disaster site
- Determine the capacity of these warehouses
- Determine their availability over a specific period of time
- Specify whether the warehouses are government-owned, UN/PVO/NGO/IO-owned, or privately owned
- Determine whether they are staffed
- Determine the cost per square meter
- Assess the adequacy of warehouse construction
 - Ventilation
 - Lighting
 - Hard floor
 - Fireproofing
 - Loading docks
- Condition of roof (check during day)
- Describe available loading and unloading equipment
 - Pallets
 - Forklifts and fuel

- Ascertain that adequate security exists:
 - Perimeter fence
 - Lighting
 - Guards
- Determine whether any refrigeration is available
- Determine whether sorting and repackaging facilities exist
- Determine whether fumigation is necessary and if the warehouse is available for food, medicines, and so forth
- If assessing a functioning warehouse, determine:
 - Accounting and recordkeeping procedures
 - Bin/stock cards on piles (They must match the warehouse register.)
 - Physical inventory checks at random intervals
 - Use of waybills
 - Stacking methods
 - Spacing system between rows
 - Cleanliness
 - Commodity handling system
 - Reconstitution of damaged goods
 - Prompt disposal of damaged goods
 - First-in and first-out system



Reservists Clearing Roads of Debris During Hurricane Katrina

Appendix B - General Capacities

Information contained in this section is provided for reference purposes. Department of Defense and Air Force directives will take precedence always.

Aircraft Type	Pallet Positions	Cargo STON		Passengers ^{4,6}		Standard NEO Passengers
		ACL ²	Planning ³	ACL	Planning	
C-130	6	17	12	90	80	92/74 ⁵
C-17	13	30	19	153	120	200/153 ⁵
C-5	36	89	61.3	73	51	73
KC-10	23	60	32.6	75	68	75
KC-135	6	18	13	53	46	53
A-330	-	-	-	240	240	266
A-300-600	15	79	69	-	-	-
B-747	34	113	98	315	315	380
B-757	15	38	33	125	125	220
B-767	24	67	58	190	190	235
B-777	-	-	-	246	246	320
DC-8	16	40	35	-	-	-
DC-10-10	30	40	35	175	175	350
DC-10-30	30	79	69	242	242	350
L-1011	26	48	42	180	180	335
MD-11	34	98	85	267	267	300

Notes:

1. Cargo and passenger payloads (except for the C-5) are exclusive of each other.
2. Organic (except C-130) calculated as the maximum ACL for a 3,200 nautical mile leg, CRAF calculated for a 3,500 nautical mile leg. C-130 calculated based on a 2,000 nautical mile leg.
3. CRAF based on mixed Service averages (B-747-100 Eq = 78 STON)
4. CRAF maximum and average passengers are the same because passengers are loaded to the maximum allowable by weight.
5. Lower NEO number reflects life raft capacity.
6. Weights are based on 400 lbs per passenger, which includes passenger, baggage, and combat gear. Take total passenger weight into account as part of total cargo weight when requirements dictate movement of cargo and passengers on the same aircraft.

Aircraft Payloads¹²⁸ (See Note 1)

Motor Asset Description	Cargo Characteristics		
	Length (in)	Width (in)	Weight (lbs)
Commercial semitrailer, flatbed, 40-foot	480	96	48,000
M1070, heavy equipment transporter, HET	420	120	140,000

Note: Boldface type indicates that overhang is allowed

Motor Asset Capacity for Surface Movements¹²⁹



Offloading Cargo During Humanitarian Operations in Banda Aceh After the 2004 Tsunami.



Military Truck Support During Hurricane Katrina

Appendix B - General Capacities

Eligible Cargo Capacity	Interior			Capacity STON
	Length (in)	Width (in)	Height (in)	
20-foot container	232	90	92 ¹	23.5
40-foot flatrack	462	102	126	25.0 ²
Quadraple Container	90	53	74 ³	4.0

Notes:

1. Door height is 89 inches
2. Assumes flatrack is lifted. Capacity when used as a false deck is 67.2 STON.
3. Door height is 70 inches

Container Capacities¹³⁰

Rail Asset Description	Cargo Characteristics			
	Length (in)	Width (in)	Height (in)	Weight (lbs)
60-foot rail flatcar	648	124	-	150,000
68-foot DODX rail flatcar	744	125	-	299,000
89-foot rail flatcar	996	102	-	110,000
89-foot rail bi-level car - Level 1	1,004	100	84	40,000
- Level 2	1,004	100	114	40,000
KS, Light European railcar	492	109	-	59,500
RS, Medium European railcar	728	104	-	124,400
RMMS, Medium European railcar	498	114	-	130,000
RES, Medium European railcar	728	104	-	124,500
SAMMS, Heavy European railcar	590	122	-	143,200
KRN 40T, Korean 42-foot flatcar	504	102	-	80,000
KRN 50T, Korean 50-foot flatcar	588	114	-	108,000
KRN 50W, wide Korean 49-foot car	588	132	-	108,000
KRN 63T, Korean deepwell flatcar	252	125	-	126,000
KRN 70T, Korean deepwell flatcar	630	144	-	154,000

Note: Boldface type indicates that overhang is allowed

Rail Asset Capacity for Surface Movements¹³¹

Ship Type	Average Usable Cargo Space (sq ft) ¹	Average TEU Capacity (Weather Deck) ²	Average TEU Capacity (Below Deck) ²	Average TEU Capacity (All Container Sockets) ²
LMSR – All	280,361	128	209	337
LMSR – Conversion	233,969	63	216	279
LMSR – New Construction	292,733	146	207	353
Fast Sealift Ship	152,774	184	46	230
Auxiliary Crane Ship	9,224 ³	240	364	604
Breakbulk	48,625	-	-	-
Non-Self-Sustaining Container Ship	-	-	-	2,718
Self-Sustaining Container Ship	-	-	-	1,763
Notional Roll-On/Roll-Off	117,668	459	-	459

Notes:

1. Assumes 25 percent broken stowage without containers loaded.
2. Reduces the average usable cargo space.
3. Cargo space on main deck without containers.

Ship Characteristics Used for Sealift Movement¹³²

Asset	Planning Load Weight	Passengers
Landing Craft, Air Cushioned ¹	75 STON max/overload or	24
Landing Craft, Utility ¹	143 STON or	400
UH-60L "Blackhawk" helicopter ²	9,000lbs external 2,640lbs internal or	11
CH-47D "Chinook" helicopter ²	26,000lbs external center hook 19,500lbs internal or	33
Notes:		
1. Refer to US Marine Corps, <i>Amphibious Ships and Landing Craft Data Book</i> , (Washington, DC: Department of the Navy, 29 August 2001), 29-30.		
2. Refer to US Army Fact File at http://www.army.mil/fact_files_site/aircraft.html accessed 21 November 2006.		

Other Transportation Asset Characteristics



Offloading an AIRBUS *Beluga* Specialized Aircraft

Appendix C - Legal Authority

DoD approval for HA missions rests with the President and the Secretary of Defense (SECDEF). The DoS requests DoD capabilities for foreign disasters, and the DHS requests DoD capabilities for domestic disasters. The Chairman of the Joint Chiefs of Staff (CJCS), by the authority and at the direction of the SECDEF, can then order deployments. HA commanders should remain aware of appropriate national and international directives, mandates, resolutions, or other documents related to the HA mission.

Achieving success in an HA operation requires HA forces to exercise authority in accordance with international and domestic laws. HA forces must understand and act according to the interests, prerogatives, and authority of numerous levels of civil government and agencies involved in HA.

Law of Armed Conflict¹³³

DoD policy is to apply law of armed conflict principles in every military operation, regardless of how that operation is characterized. See DoD Instruction (DoDI) 5500.17, *Department of Defense Law of War Program*. Specific legal responsibilities associated with armed conflict that may directly influence FHA operations include physical care for civilians or noncombatants, property issues, and law enforcement responsibilities. In most cases, there will be specific HN or US legal provisions applicable to the situation. Many issues may confront the commander that will not be governed by the Geneva Conventions. Therefore, the commander should consult with the staff judge advocate (SJA) for legal advice on how to address these issues. *Naval Warfare Publication (NWP) 1-14M*, *The Commander's Handbook on the Law of Naval Operations*, *AFPD 51-4*, *Compliance with the Law of Armed Conflict*, *Air Force Handbook 10-222 Volume 22*, *Refugee Camp Planning and Execution Guide*, and *Field Manual 27-10*, *The Law of Land Warfare*, provide detailed guidance for many of these issues.

FHA Forces

Members of FHA forces remain subject to applicable national laws, policies, and regulations of their own nations, including military criminal codes. All US military personnel remain subject to the *Uniform Code of Military Justice* which will be administered by the appropriate military commander. JFCs are responsible for the discipline and administration of personnel assigned to the Joint organization, and may be delegated courts-martial authority by the combatant commander or the Secretary of Defense. In addition to the administration and disciplinary authority exercised by subordinate JFCs, a combatant commander may prescribe procedures by which the senior officer of a military service assigned to the headquarters element of a

Joint organization may exercise administrative and nonjudicial punishment authority over personnel of the same military service assigned to the same Joint organization. Absent international agreement provisions to the contrary, members of FHA forces also are subject to HN law and to actions in HN criminal and civil courts. Therefore, commanders must ensure that Status of Forces Agreements (SOFAs) are in place before any forces are deployed to the area of operations. More detailed information may be found in JP 0-2, *Unified Action Armed Forces (UNAAF)*, and the *Manual for Courts-Martial*.

Status-of-Forces Agreements

A Status of Forces Agreement (SOFA) defines the legal status of a military force when deployed in the territory of a friendly state. A SOFA does not itself authorize the presence or activities of those forces. The purpose of a SOFA during FHA operations is to define how the sending and receiving states will share their sovereign prerogatives. SOFAs seek to define the rights, immunities, and duties of the force and its members. If no treaty or SOFA exists with the affected country, the Department of Defense must become involved in establishing the status of US forces. Authority to negotiate and conclude SOFAs must be obtained from the DoS under its Circular 175 Procedure (*11 FAM 720 Negotiation and Conclusion*). In cases where time or circumstances do not permit the negotiation of a full SOFA, adequate protection for US forces may be obtained by an exchange of diplomatic notes between the United States and the HN. The DoS will have the lead for this action. Department of Defense Directive 5530.3, *International Agreements*, provides guidance regarding the negotiation and conclusion of SOFAs.

Legal Status of UN Volunteers

United Nations volunteers (UNVs) are not UN *staff* members and as such are not subject to UN staff rules and regulations. They are persons who are performing functions or assignments for the UN under a contract of employment and are considered *agents* of the UN. The International Court of Justice's 11 April 1949 advisory opinion established the need for agent protection as a condition of satisfactory duty performance. UNVs are under UN protection and enjoy some of the privileges and immunities accorded to UN staff officials. The 1946 Conventions on Privileges and Immunities of the United Nations specify that the privileges and immunities are granted in the interest of the UN organizations and not for the personal benefit of the individuals themselves. The organizations must cooperate at all times with the authorities of members to facilitate the administration of justice and secure the observance of law to prevent occurrence of any abuse in connection with privileges and immunities. UNVs

are similar to UN staff members in that they are immune from legal action with respect to words spoken or written and all acts performed by them in their official capacity. In general, they are exempt from taxation by the nation in which performing UNV duties, if different than the nation of citizenship. They are also exempt from national service obligations. The United Nations Development Program resident representative is responsible for all arrangements relating to the security and protection of UNVs under the international instruments applicable to the UN and to its employees. When supporting the UN, US personnel may be entitled to expert-on-mission status under the 1946 *Convention on Privileges and Immunities of the United Nations*. This status provides some protection from the criminal and civil jurisdiction of the HN. Commanders and legal advisers should be familiar with *The Convention on the Safety of United Nations and Associated Personnel*.

Legal Status of NGOs

No legal regime governs the status and activities of NGOs. Except for the regionally oriented Convention of the Council of Europe, no international convention grants NGOs legal personality or authority in the territories of States. NGOs have a national legal status corresponding to the country in which each was established and is recognized. Their national government authorities and those of the affected country are the source of protection for them and their personnel and volunteers.

Internally Displaced Persons and Human Rights Law

Human rights law is the principal source of protection for internally displaced persons. Unlike refugee law which only applies when a border is crossed, human rights law proclaims broad guarantees for the fundamental rights of all persons. The *International Bill of Human Rights*, composed of the “Universal Declaration of Human Rights,” the “International Covenant on Civil and Political Rights,” and the “International Covenant on Economic, Social, and Cultural Rights,” forms the main body of human rights law. These instruments guarantee a series of rights applicable to situations experienced by internally displaced populations. These vary from negative rights (that no one shall be subjected to torture, arbitrary interference with family, home, or privacy, or arbitrary property deprivation) to affirmative rights, such as an adequate standard of living, liberty, and personal security. Although human rights law provides a basis for protecting and assisting internally displaced persons, it does not address some situations such as forcible displacement and lack of access to HA. There is a specific need for protection of persons

Appendix C - Legal Authority

internally displaced by conflict. The four 1949 Geneva Conventions reaffirm that during armed conflict those not directly participating in the hostilities shall be treated humanely. Violence, hostage-taking, and outrages upon the dignity of noncombatants during armed conflict are prohibited. As noted previously, the United States applies these principles to all military operations, including FHA. Additionally, Protocol II to the Geneva Convention provides that forced civilian displacement during internal armed conflicts may be undertaken legally only when the civilian's safety or military necessity require it. If civilians have to be moved for either of these two reasons, their evacuation must be under protected, hygienic, and humane conditions. Relevant factors that may be used in classifying displaced persons include external aggression, occupation, foreign domination, or events seriously disturbing public order.

Refugees and Asylum Seekers

International law defines a refugee as a person outside his or her country of origin, who is unable or unwilling to return because of valid fear of persecution on grounds of race, religion, nationality, social group, or politics. States may be subject to legal consequences for failing to respect the principle of *nonrefoulement* (that no refugee should be returned to any country where he or she is likely to face persecution or danger to life or freedom) or for failing to return refugees back to States under certain conditions. The 1951 *Convention Relating to the Status of Refugees* and the 1967 *Protocol relating to the Status of Refugees* remain the principal international instruments benefiting refugees. The *United States Refugee Act of 1980* accepts the definition of refugees offered by the 1951 Conventions and 1967 Protocol and also makes provision for annual intakes of refugees from groups of specific humanitarian interest to the United States. DoDD 2000.11, *Procedures for Handling Requests for Political Asylum and Temporary Refuge*, provides more information.

Civilian Detainee Procedures

The detention of civilians during FHA operations will normally be an issue only when HN law enforcement capabilities do not exist. JTF commanders should, however, be prepared to address the handling of civilian detainees within the Joint operations area. Key considerations for development of procedures include:

- Authority permitting detention (What conduct warrants detention and who has legal jurisdiction to conduct criminal trials?)
- Length of time civilians will be detained or processed
- How criminals will be imprisoned
- At what point detainees can be transferred to some recognized security or police force

Eligibility for Medical Care

A determination of eligibility for care in a US medical treatment facility (MTF) must be made at the highest possible level and in conjunction with the supporting SJA. Each category of personnel who might seek emergency or routine treatment (such as DoD contractors; USG civilian employees; and allied, coalition, or HN forces) in a US MTF should be determined prior to initiation of the operation and updated as required.

Claims

JTF elements should investigate and adjudicate claims according to established directives and regulations consistent with the terms of a SOFA or other international agreement that includes claims provisions. A single-service component may be assigned responsibility for processing claims against the USG. Unless otherwise stated in JTF command guidance, unit-level commanders are responsible for investigating incidents of foreign property damage and personal injury or death to foreign nationals

alleged to have been caused by JTF personnel. JTF legal personnel should be appointed as foreign claims commissions with authority to adjudicate and pay foreign claims. Single-service claims authority is established by DoDD 5515.8, *Single-Service Assignment of Responsibility for Processing of Claims*. The supported combatant commander may assign interim responsibility for resolving claims in countries where such assignment has not been made under the directive.

Environment

As a general rule, US environmental laws have no application overseas; however, US personnel are to follow pollution control standards of general applicability in the host country or jurisdiction (Executive Order 12088; DoDI 4715.5, *Management of Environmental Compliance at Overseas Installations*). Where country specific final governing standards (FGS) apply, abide by them. In a foreign nation where the designated DoD environmental executive agent has not established FGS, applicable international agreements, HN standards and the *Overseas Environmental Baseline Guidance Document* (OEBGD) govern. Particular attention should be paid to the disposal of hazardous waste. FGS and OEBGD only apply, however, to installations and facilities. They do not apply to off-installation operational deployments. Such off-installation activities are governed by applicable international agreements and environmental annexes to operation plans and orders.

Law of the Sea

The duty to rescue those in distress at sea is firmly established in customary and conventional international law (Article 98, *UN Convention on the Law of the Sea*, 1982). Asylum seekers have been escaping by sea for many years. Several options are open to the state where those rescued arrive. It may refuse disembarkation and may require ship masters to remove them from the jurisdiction or it may make disembarkation conditional upon satisfactory settlement guarantees. The state may also require care and maintenance to be provided by the flag country, by their country or state of registry, or by international organizations. A categorical refusal of disembarkation cannot be equated with a breach of the principle of nonrefoulement or refuge through time (because of State sovereignty) even though refusal results in serious consequences for asylum seekers.

Rules of Engagement

The sensitive political and international nature of FHA operations require that ROE be established and coordinated with other forces involved in the operation. Chairman of the CJCS Instruction 3121.01A, 15 January 00, *Standing Rules of Engagement for US Forces*, provides fundamental policies and

procedures for US commanders. It is US policy that ROE never limit a commander's inherent authority and obligation to use all necessary means available and to take all appropriate action in self defense of the unit or other US forces. ROE for FHA operations will commonly be characterized by restraint. All coalition nations operating within a humanitarian relief area should do so under a commonly established ROE, whenever possible. This is essential to assure consistency of response for all participating forces.

US military forces follow certain precepts essential to ROE. The first is that a commander has the authority and obligation to use all necessary means available and to take appropriate actions to defend that commander's unit and other US forces in the vicinity from a hostile act or demonstration of hostile intent. The second precept is that at all times, the requirements of necessity and proportionality will form the basis for the judgment as to what constitutes an appropriate response to a particular hostile act or demonstration of hostile intent. Necessity exists when a hostile act occurs or when a force or terrorist exhibits hostile intent. Proportionality requires that the use of force must be reasonable in intensity, duration, and magnitude to decisively counter the perceived or demonstrated threat.

ROE should be coordinated in detail and may change as the operation evolves. Changes to ROE must be rapidly disseminated to all personnel. Commanders at all levels may request changes to the ROE through the chain of command. Figure C-1 is provided as a sample ROE card. These ROE were established for forces conducting FHA operations in an uncertain or hostile environment. Such a card may be carried by all personnel for periodic reference.

Intelligence Oversight and Operational Law

Intelligence oversight regulations should be reviewed for applicability, especially with regard to relationships between intelligence personnel and American citizens who work for NGOs and IOs. A legal review should be conducted prior to the initiation of intelligence operations to ensure that there is no

- **You have the right to use force to defend yourself against attacks or threats of attack**
- **Hostile fire may be returned effectively and promptly to stop hostile acts**
- **When US forces are attacked by hostile elements, mobs, and rioters, US forces should use the minimum force necessary under the circumstances and proportional to the threat**
- **You may not seize the property of others to accomplish your mission**
- **Detention of civilians is authorized for security reasons or in self-defense**
- **The United States is not at war**
- **Treat all persons with dignity and respect**
- **Respect local customs and traditions of the host nation**
- **Use minimum force to carry out the mission**
- **Always be prepared to act in self-defense**

Figure C-1. Sample Rules of Engagement Card

Appendix C - Legal Authority

unforeseen impact upon the mission from the conduct of planned intelligence or information gathering operations.

Fiscal Law

Fiscal law principles apply to FHA operations. Expenditures in an FHA operation must be for an authorized purpose and made within applicable time periods and authorized amounts. Congress has provided limited authority for the DoD to conduct overseas humanitarian, disaster, and civic aid operations (Title 10 USC, Section 401, 402, 2547, and 2561). Generally, all costs incurred by the DoD arising from the conduct of HA operations will be reimbursed by the supported federal agency. Increasingly, HA is provided through the drawdown of defense articles from existing stocks. This drawdown authority is provided for in Title 10 USC, Section 2318(1)(A). Because drawdown authority is limited to the use of existing defense articles, commanders must be sensitive to the fiscal limitations involved (for example, no new contracts for goods or services may be made using drawdown funds). All expenditures for HA operations should be reviewed to ensure compliance with fiscal law.

The *Posse Comitatus Act*¹³⁴

The *Posse Comitatus Act* and Department of Defense Directive (DoDD) 5525.5, *DoD Cooperation with Civilian Law Enforcement Authorities*, provide the authority and define the conditions under which military forces can be employed, as well as criminal penalties and the legal constraints intended to prevent misuse of military force. With the exception of members of the US Coast Guard and members of the National Guard in state service, military personnel are normally prohibited under either the *Posse Comitatus Act* or DoD policy from direct participation in the execution of civil laws in the United States. Under the provisions of this act and DoD policy, military personnel are prohibited from:



National Guard Troops Move Bottles of Water for Hurricane Relief Operations



The Aftermath of Hurricane Katrina

- Participating in the arrest, search and seizure, and stopping and frisking of personnel, or domestic interdiction of vessels, aircraft, or vehicles
- Conducting domestic surveillance or pursuit
- Operating as informants, undercover agents, or investigators in civilian legal matters
- Participating in law enforcement cases or in any other civilian law enforcement activity

Stafford Act¹³⁵

The Federal Response Plan, January 2003, invokes the *Robert T. Stafford Disaster Relief and Emergency Assistance Act*, which provides the authority for the federal government to respond to emergencies and major disasters. The act gives the President the authority to establish a program for disaster preparedness and response support, which is delegated to DHS.

The Denton Amendment¹³⁶

The Denton Amendment authorizes the Denton Program—a commodities transportation program authorized under Title 10 USC Section 402 and jointly administered by the USAID, DoS, and DoD. The Denton Amendment provides the authority for DoD to use extra space on US military cargo aircraft to transport humanitarian assistance materials donated by NGOs, IOs, and PVOs for humanitarian relief.

Appendix D - Quick Situation and Needs Assessment¹³⁷

General

- Village or City Name
- Grid
- Sector
- Language

Population

- Total Population
- Families
- Male
- Female
- Children
- Refugees
- Refugee Origin Abroad

Standard of Living (General Description or Percentage)

- Food
- Water
- Shelter
- Power
- Television
- Radio
- Transportation

Ethnic Composition by Percent

- As required by situation

Politics

- Parties
- Representatives

Emergency Services

- Police
- Fire
- Rescue
- Militia

Key Persons

- Mayor
- Police Chief
- Military Commander
- Representative

Economics

- Unemployed
- Self-Employed
- Nature of Self-Employment
- Employed
- Nature of Employment
- Agriculture
- Industry

Lines of Communication and Utilities

- Communications
- Water Supply

- Electrical Supply
- Road System
- Rail System
- Medical Facilities
- Education Facilities

Observations

- As required by situation



Severely Damaged Buildings and Equipment Seen During Hurricane Katrina

Appendix E - Reference Items and Notes

Important Internet References

Joint Center for Operational Analysis
http://www.jfcom.mil/about/fact_jcoa.htm

Air Force Lessons Learned
<https://afknowledge.langley.af.mil>

Air Force Knowledge Management
<https://afkm.wpafb.af.mil>

Center for Army Lessons Learned
<http://call.army.mil/>

Marine Corps Center for Lessons Learned
<http://www.mccell.usmc.mil/>

Navy Lessons Learned System
<http://www.nwdc.navy.mil/NLL/NLL.aspx>

Important Doctrine References

Air Force Civil Engineering and Services Agency, Air Force Handbook 10-222, Volume 22, *Refugee Camp Planning and Construction Handbook*, Department of the Air Force, 2000.

Air, Land, and Sea Application Center, *Multiservice Procedures for Humanitarian Assistance Operations*, Washington, DC: ALSAC, Oct 1994.

Institute for Defense Analysis, *Worldwide Humanitarian Assistance Logistics System Handbook*, Alexandria, VA: IDA, 2004.

Joint Publication 3-07.6, *Joint Tactics, Techniques, and Procedures for Foreign Humanitarian Assistance*, Washington, DC: JCS, 15 Aug 2001.

US Agency for International Development, *Field Operations Guide for Disaster Assessment and Response, volume 4*, Washington, DC: USAID, 2005.

US Army John F Kennedy Special Warfare School, *Civil Affairs Humanitarian Assistance Planning Guide*, GTA 41-01-003, Fort Bragg, NC, USA, 2005.

Handbook Acronyms

AOR - Area of responsibility
CJCS - Chairman of the Joint Chiefs of Staff
CMOC - Civil-Military Operations Center
COCOM - Combatant Commander
CRAF - Civil Reserve Air Fleet
DART - Disaster Assistance Response Team

DCO - Defense Coordinating Officer
DFO - Disaster Field Office
DHS - Department of Homeland Security
DJTFAC - Deployable Joint Task Force Augmentation
DoD - Department of Defense
DoDD - Department of Defense Directive
DoDI - Department of Defense Instruction
DoS - Department of State
FEMA - Federal Emergency Management Agency
FHA - Foreign Humanitarian Assistance
HA - Humanitarian Assistance
HACC - Humanitarian Assistance Coordination Center
HAST - Humanitarian Assistance Survey Team
HCA - Humanitarian And Civic Assistance
HET - Heavy Equipment Transporter
HN - Host Nation
HOC - Humanitarian Operations Center
ICRC - International Committee of the Red Cross
IFRC - International Federation of Red Cross
IO - International Organization
JFC - Joint Force Commander
JFUB - Joint Facilities Utilization Board
JIACG - Joint Interagency Coordination Group
JMC - Joint Movement Center
JP - Joint Publication
JTF - Joint Task Force
JTFSC - Joint Task Force Support Command
KRN - Korean
LMSR - Large Medium Speed Roll-On Roll-Off Vessel
LOC - Logistics Operations Center
MHE - Material Handling Equipment
MTF - Medical Treatment Facility
NEO - Noncombatant Evacuation Operation
NGO - Nongovernmental Organization
OEBGD - Overseas Environmental Baseline Guidance Document
OFDA - Office of Foreign Disaster Assistance
PVO - Private Voluntary Organization
RFA - Request For Assistance
ROE - Rules Of Engagement
SAMMS - Standard Army Materiel Management System
SJA - Staff Judge Advocate
SOFA - Status-of-forces Agreement
STON - Short Ton
TEU - Technical Escort Unit
UN - United Nations
UNAAF - Unified Action Armed Forces
UNV - United Nations Volunteer
USAID - United States Agency for International Development

USARNORTH - United States Army North
USC - United States Code
USG - United States Government
USNORTHCOM - United States Northern Command
USTRANSCOM - United States Transportation Command

Glossary

Consequence Management. Those measures taken to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of a chemical, biological, nuclear, and high-yield explosive situation. For domestic consequence management, the primary authority rests with the States to respond and the Federal Government to provide assistance as required. (This term and its definition are provided for information and proposed for inclusion in JP 1-02 by JP 3-0.)

Crisis Management. Measure to resolve a hostile situation and investigate and prepare a criminal case for prosecution under federal law. Crisis management will include a response to an incident involving a weapon of mass destruction, special improvised explosive device, or a hostage crisis that is beyond the capability of the lead federal agency. (This term and its definition are approved for inclusion in the next edition of JP 1-02.)

Dislocated Civilian. A broad term that includes a displaced person, a stateless person, an evacuee, an expellee, or a refugee. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

Displaced Person. A civilian who is involuntarily outside the national boundaries of his or her country. (JP 1-02)

Evacuee. A civilian removed from a place of residence by military direction for reasons of personal security or the requirements of the military situation. (JP 1-02)

Foreign Disaster. An act of nature (such as a flood, drought, fire, hurricane, earthquake, volcanic eruption, or epidemic), or an act of man (such as a riot, violence, civil strife, explosion, fire, or epidemic), which is or threatens to be of sufficient severity and magnitude to warrant United States foreign disaster relief to a foreign country, foreign persons, or to an international organization. (JP 1-02)

Foreign Disaster Relief. Prompt aid that can be used to alleviate the suffering of foreign disaster victims. Normally it includes humanitarian services and transportation; the provision of food, clothing, medicine, beds, and bedding; temporary shelter and

Appendix E - Reference Items

housing; the furnishing of medical materiel and medical and technical personnel; and making repairs to essential services. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

Foreign Humanitarian Assistance. Programs conducted to relieve or reduce the results of natural or manmade disasters or other endemic conditions such as human pain, disease, hunger, or privation that might present a serious threat to life or that can result in great damage to or loss of property. Foreign humanitarian assistance provided by US forces is limited in scope and duration. The foreign assistance provided is designed to supplement or complement the efforts of the host nation civil authorities or agencies that may have the primary responsibility for providing foreign humanitarian assistance. Foreign humanitarian assistance operations are those conducted outside the United States, its territories, and possessions. Also called FHA. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

Humanitarian Demining. Department of Defense and Department of State program to promote the foreign policy interests of the United States by assisting other nations in protecting their populations from land mines and clearing land of the threat posed by land mines remaining after conflict has ended. The humanitarian demining program includes training of host nation deminers, establishment of national demining organizations, provision of demining equipment, mine awareness training, and research development. (This term and its definition are approved for inclusion in the next edition of JP 1-02.)

Interagency Coordination. Within the context of Department of Defense involvement, the coordination that occurs between elements of Department of Defense, and engaged US Government agencies, nongovernmental organizations, and regional and international organizations for the purpose of accomplishing an objective. (JP 1-02)

Internally Displaced Person. Any person who has left his or her residence by reason of real or imagined danger but has not left the territory of his or her own country. (This term and its definition are approved for inclusion in the next edition of JP 1-02.)

International Organization. Organizations with global mandates, generally funded by contributions from national governments. Examples include the International Committee of the Red Cross, the International Organization for Migration, and United Nation agencies. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

Natural Disaster. An emergency situation posing significant danger to life and property that results from a natural cause. (This term and its definition are approved for inclusion in the next edition of JP 1-02.)

Nongovernmental Organizations. Transnational organizations of private citizens that maintain a consultative status with the Economic and Social Council of the United Nations. Nongovernmental organizations may be professional associations, foundations, multinational businesses, or simply groups with a common interest in humanitarian assistance activities (development and relief). *Nongovernmental organizations* is a term normally used by non-United States organizations. Also called NGOs. (JP 1-02)

Refugee. A person who, by reason of real or imagined danger, has left his or her home country or country of his or her nationality and is unwilling or unable to return. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

Rules of Engagement. Directives issued by competent military authority that delineate the circumstances and limitations under which United States forces will initiate and continue combat engagement with other forces encountered. Also called ROE. (JP 1-02)

Stateless Person. Civilian who has been denationalized or whose country of origin cannot be determined or who cannot establish a right to the nationality claimed. (This term and its definition are approved for inclusion in the next edition of JP 1-02.)

Status-of-Forces Agreement. An agreement that defines the legal position of a visiting military force deployed in the territory of a friendly state. Agreements delineating the status of visiting military forces may be bilateral or multilateral. Provisions pertaining to the status of visiting forces may be set forth in a separate agreement, or they may form a part of a more comprehensive agreement. These provisions describe how the authorities of a visiting force may control members of that force and the amenability of the force or its members to the local law or to the authority of local officials. To the extent that agreements delineate matters affecting the relations between a military force and civilian authorities and population, they may be considered as civil affairs agreements. Also called SOFA. (JP 1-02)

Unified Action. A broad generic term that described the wide scope of actions (including the synchronization of activities with governmental and nongovernmental agencies) taking place within unified commands, subordinate unified commands, or Joint task forces under the overall direction of the commanders of those commands. (JP 1-02)

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Leading an AEF Rotation

A GROUP COMMANDER'S PERSPECTIVE

Colonel Lyndon S. Anderson, USAF

The purpose of this handbook is to discuss AEF leadership from a group commander's perspective with emphasis on leading an AEF rotation. The intent is to inform, educate, and start a dialogue whereby leaders can share their experiences and knowledge with others. This handbook is based on experience gained from commanding the 379th Expeditionary Mission Support Group (EMSG) at Al Udeid Air Base, Qatar. The unit's task was to support the Global War on Terrorism by overseeing the base operations support mission for approximately 6,000 members of the 379th Air Expeditionary Wing, the Combined Air Operations Center, and a host of tenant units.



ABOUT THE AUTHOR: COLONEL LYNDON S. ANDERSON, USAF, IS THE CHIEF, DEPOT MAINTENANCE PROGRAMS DIVISION, HEADQUARTERS AIR FORCE MATERIEL COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.

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Leading an AEF Rotation

A GROUP COMMANDER'S PERSPECTIVE

> Foreword



This handbook is based on experience gained from commanding the 379th Expeditionary Mission Support Group (EMSG) at Al Udeid Air Base, Qatar. The concepts, initiatives and programs presented in this handbook center around the ideas of leading people and managing base operations within an EMSG; however, many of these ideas are transferable for application, either directly or indirectly, to other deployed wings, groups, or squadrons.

To set the stage, the 379th EMSG's task was to support the Global War on Terrorism by overseeing the base operations support mission for approximately 6,000 members of the 379th Air Expeditionary Wing, the Combined Air Operations Center, and a host of other tenant units. The base was well established, even

though it was transitioning from tents to semi-permanent trailers. The vast majority of personnel assigned to the base lived in Coalition Compound, a housing area on the installation but separated from the main base. The compound consisted of 136 dorm trailers, with most of the flights belonging to the 379th Expeditionary Services Squadron. The work facilities were mostly trailers with a few organizations still working out of tents.

The 379th EMSG was comprised of six squadrons and a personnel support for contingency operations (PERSCO) team. The group was made up of approximately 1,400 rotational military members. Additionally, the group had 60 permanent-party military members comprising the leadership team and a handful of Department of Defense (DoD) civilians and contractors.

The primary mission of the 379th Air Expeditionary Wing was to fill air tasking orders and other support requirements levied by the Joint Forces Air Component Commander in support of Operations Iraqi Freedom, Enduring Freedom, and Combined Joint Task Force Horn of Africa. The 379th EMSG's task was to provide base operating support for the wing and other tenant units assigned to the installation. Over the course of the following year, we would work our way through three full air expeditionary force (AEF) rotations.

This handbook should be used as a reference only—Department of Defense and Air Force directives will always take precedence.

The views expressed in this document are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the US Government.

Chapter 1 - The AEF Rotation

Establishing a Timeline

Looking at a rotation from the perspective of time helps to frame the many tasks associated with a 120-day rotation. This perspective adds order and structure to the many actions that need to be accomplished to effectively lead and manage an AEF rotation.

Figure 1 provides a timeline used by EMSG to sequence events through a rotational cycle. In order to provide a structured flow of events, in chronological order, the timeline groups the events into three periods: pre-rotation, rotation, and post-rotation.

An AEF rotation generally has a defined start and end date set by the AEF Center. Official pre-rotation preparations and personnel arrival begin approximately 30 days prior to the official start date of the rotation. The AEF rotation ends 120 days after the official start date.

The 120-day rotational timeline is typically not followed by aviation organizations, such as expeditionary mission support groups and expeditionary medical groups. Most personnel assigned to these groups rotate in accordance with the AEF cycle, except for the personnel assigned to security forces and vehicle operations who rotate on a 179-day cycle because of increased deployment requirements and limited manpower.

Personnel assigned to expeditionary operations groups and the expeditionary maintenance groups generally rotate with movement of aircraft. Units assigned to these groups rotate on a nonstandard cycle linked more closely to the rotation of aircraft rather than a standard AEF cycle. These groups are also subject to seemingly continuous movement of personnel because of the types of aircraft flown and unit of assignment. For example, some reserve component flying units arrived every 40 days, while others would send the aircraft for a full 120-day rotation, but rotate the

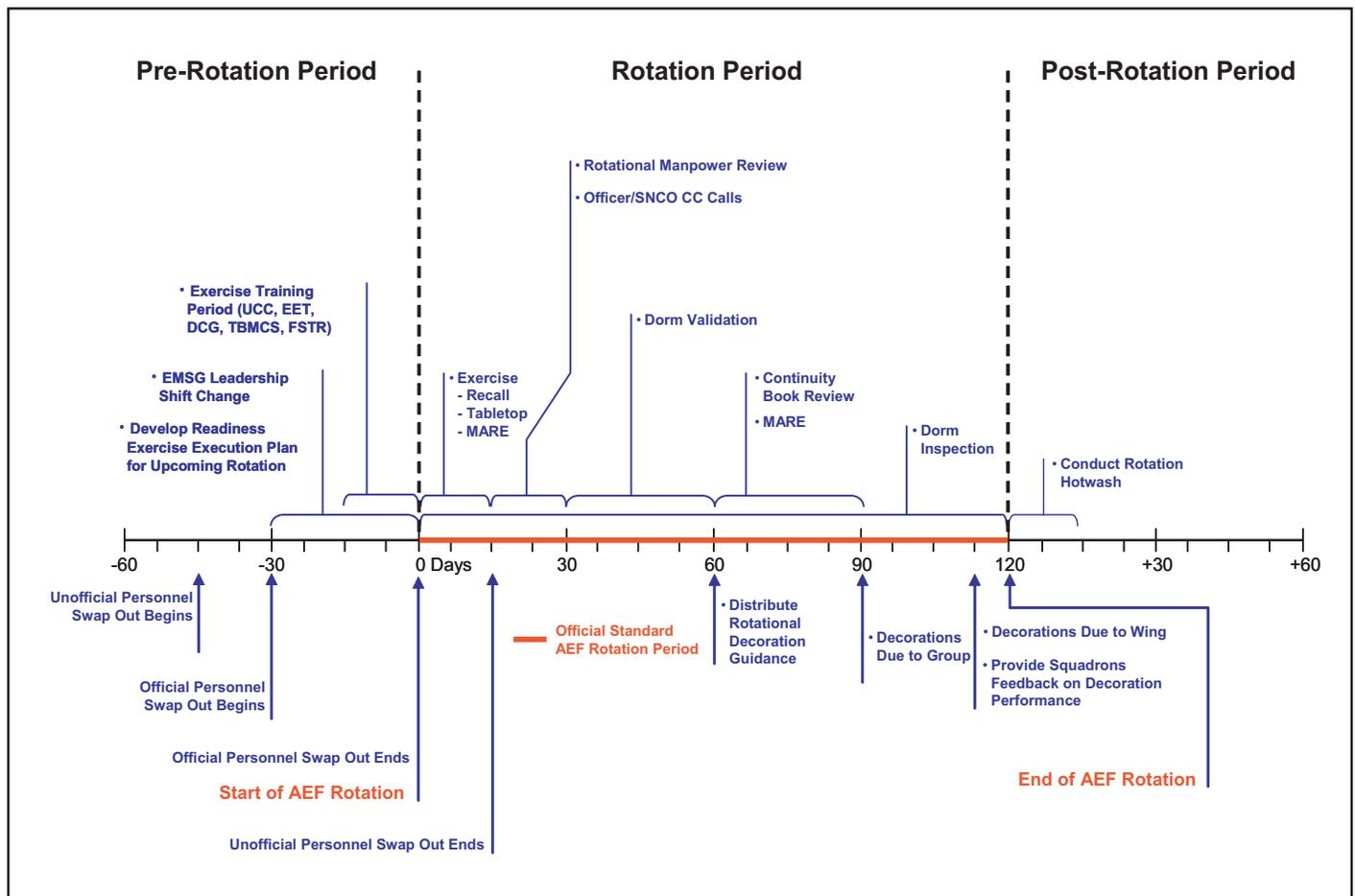


Figure 1. AEF Rotation Management Timeline

people every 30 days. Other units would rotate aircraft and personnel on a monthly basis.

Pre-Rotation Period

Typically, 30 days prior to the official rotation start date, several activities need to be considered and accomplished; for example, in-processing and lodging accommodations for inbound personnel, as well as accommodations for outbound personnel. It is not uncommon for personnel to arrive as early as 30 days prior to the rotation and continue arriving as late as 2 weeks into the AEF cycle.

Upon arrival, personnel must in-process into the country and onto the base. In most cases, a defense cooperative agreement between the United States and the host nation defines entrance criteria. Usually, a military member or government official enters the country and immigrates with a valid identification card and a set of orders. All personnel, however, must abide by the host nation's customs requirements as described in the Department of State's *Foreign Clearance Guide*. The most common customs problems at Al Udeid involved attempts to enter the country with alcohol, pornography, or illegal or unauthorized weapons.

Next, all personnel are required to in-process onto the base. At Al Udeid, this was done by the base PERSCO team in order to account for every person in the United States Air Force Central Command (USCENTAF) area of responsibility. During this time, PERSCO would schedule newly arrived personnel for Right Start, a series of briefings that familiarized the individual with the base and with the installation commander's policies.

Lodging accommodations require upfront planning before new personnel arrive and during the nearly 6 weeks of transitional movement of inbound and outbound personnel. Because both incoming and outgoing personnel will be on station at the same time, units have to work closely with the expeditionary services squadron to ensure sufficient lodging is available. First sergeants and the expeditionary services squadron's transient lodging manager are the primary players in orchestrating lodging accommodations. Due to limited space in transient lodging during the rotation period, units at the deployed location have to maximize use of existing bed spaces within their assigned dorms before requesting use of transient lodging. During rotation time at Al Udeid, transient personnel swelled to above 1400 people per night.

Personnel from the outgoing rotation will generally start departing the base 1 week after personnel from the new rotation arrive. During this transition period, outgoing personnel must do a turnover with their replacement, such as clear out of their dorm and out-process from various base activities, their unit, and PERSCO. They must also satisfy the host nation's exit criteria and customs requirements.

Chapter 1 - The AEF Rotation



A US Air Force C-17 on the Ramp at Al Udeid Air Base, Qatar

Personnel in transient status must also be considered during this period. In the case of Al Udeid, the base served as a hub for movement of personnel throughout the theater of operation. These individuals were not required to formally enter and exit the country; however, they were required to satisfy customs clearance. The base had to work closely with the expeditionary logistics readiness squadron, who had responsibilities for transient personnel movement, to ensure enough lodging was available through the services squadron to meet the increased demand from transient movers.

Finally, during this pre-rotational period, time is spent planning to spin-up the next rotation for a potential major accident or for a threat response. Plans are developed and put in place to educate all players involved in readiness. Additional details on



379th Personnel Stand Formation

readiness exercises can be found in Chapter 2, Directing Readiness Exercises.

Rotation Period

During the rotation period, many activities should occur to help better manage the rotation. Early in the rotation, the unit should conduct a series of readiness exercises to ensure the emergency response teams are fully trained and familiar with base operating procedures. Additionally, commander's calls should be held to communicate standards of performance and expectations. In the beginning of the rotation, manpower reviews should also be accomplished to identify unfilled, mismatched, or training discrepancies and report them to the AEF Center, so the center can identify fixes or work-arounds. During the middle of the rotation period, dorm validations should be accomplished to ensure dorm room management is controlled and adjusted to reflect changes in the mission that, in turn, drive changes in numbers of personnel needing lodging accommodations. Throughout the rotation, commanders may want to emphasize continuity and consistency between rotations so an effective hand-over can occur. Finally, toward the end of the rotation, commanders need to focus their attention on ensuring quality letters of evaluation (LOEs) are produced for deployed personnel, and where applicable, generate necessary decorations to recognize superior performers.

Post-Rotation Period

Post-rotation activities center on capturing lessons learned and incorporating those lessons into actions to be resolved for the next rotation. Though adjustments are made throughout the rotation, a mechanism is needed to formally capture lessons and improvement initiatives so they can be incorporated into policy, guidance, or other institutionalized processes. Each of these areas will be discussed in greater length throughout this handbook.

Chapter 2 - Directing Readiness Exercises

Readiness exercises are an important mission area requiring a great deal of attention at the beginning of each rotation. The focus is to rapidly spin-up and qualify personnel for major accident responses such as an aircraft incident, security breach, or natural disaster. In the absence of a wing plans and programs (XP) function, EMSG took on the responsibilities for planning and executing the wing's readiness exercise program. A planning schedule was developed for each rotation to guide the wing through the various phases of preparation.

An exercise plan is necessary to provide a rapid path to train personnel and to practice major accident response scenarios in a stepped fashion. The first area that requires attention is team development. Though personnel arrive trained in their functional areas, none have worked together as a team at the deployed location. It is, therefore, necessary to assemble the team and push

them through their paces to ensure that they know what is expected of them.

A second area requiring immediate focus is getting the essential upfront familiarization training done as soon as possible after the rotation begins. This is necessary to reduce the vulnerability gap between rotations (that period of time between when the previous rotation's qualified team disbands and when the new rotation's emergency response teams are fully trained). During this transitional period, the wing is most vulnerable (at risk) should a major accident response be necessary. Therefore, the quicker the spin-up period can occur, the shorter the vulnerability gap will be.

The third area of focus is timing. It is important to start the planning process 30 days prior to the official start of the new rotation. This is necessary to ensure the plan is fully coordinated



379th Security Forces Personnel During Exercise Preparation

before the replacements arrive. The plan should include a clear set of wing-level objectives, the date and time for each of the readiness exercises, an organizational list of participants, and a conceptual description of the exercise scenario. The wing's leadership must review and approve the plan before implementation.

Spin-Up Period

Before the wing can exercise, it has to go through a spin-up period to provide the necessary training and familiarization required to be effective at the deployed location. Major accident response procedures, base layout, communications systems, and other pertinent training is provided to members of the exercise evaluation team, disaster control group, battlestaff, unit control centers, and full spectrum threat response representatives. These teams also receive training on the Theater Battle Management Control System (TBMCS), a command and control system used for major accident responses.

Required training begins as soon as new rotational personnel arrive (before the start of the official rotation period) and continues until all personnel are trained. Training is completed by the beginning of the new rotation, or as soon thereafter as possible (but no later than 2 weeks), so readiness exercises can commence. This is necessary to minimize the vulnerability between a fully trained response team that departed from the last rotation, and the new team arriving for the new rotation. The training occurs in three logical steps—crawl, walk, and run.

Crawl – Recall Exercise

A recall exercise is done for members of the disaster control group and battlestaff within days of the beginning of the new rotation. The objectives of the exercise is to practice the recall process and the pager and land mobile radio systems, to ensure the disaster control group and battlestaff members know where the primary assembly locations are, and to conduct inspections to ensure all personnel have the required equipment and checklists to do their jobs. During this exercise, the commander of the disaster control group and the director of the battlestaff discuss administrative issues, explain the exercise process, and have the staff conduct communication checks of desk and satellite telephones, land-mobile radios, non-secure Internet protocol router network, and secret Internet protocol router network connectivity.

Walk - Tabletop Exercise

A tabletop exercise is typically done within just a few days following the recall exercise. Participants for this exercise are

Chapter 2 - Directing Readiness Exercises



379th Security Personnel and Military Working Dog

members of the unit control centers, initial responders (fire fighters, security forces, medical, and explosive ordnance and disposal), disaster control group, battlestaff, and the exercise evaluation team. The first responders, disaster control group and battlestaff assemble at different locations and walk through the tabletop exercise in isolation from one another using a common scenario. This allows the freedom to discuss issues relative to each group without overcomplicating the exercise. It also gives each team the opportunity to discuss roles and responsibilities, command and control, and administrative duties.

The tabletop exercise has several objectives. The first objective is to practice the notification and response phases of a major accident response, while the second objective is to exercise the unit accountability process (to include off-base travelers). This is necessary to ensure units and major accident response teams have a common understanding of how unit accountability will occur. A third objective is to exercise the TBMCS command and control tool. This objective is part of every exercise to reinforce training and to ensure the tool can be effectively used during a major accident response. The final objective is to conduct another check of the communications systems at the end of the exercise to doubly ensure all personnel are familiar with the communications gear and that the gear is fully operational.

Run - Major Accident Response Exercise

A major accident response exercise is the culminating event for the readiness exercise program. It is conducted after the tabletop exercise, but no later than 2 weeks after the beginning of the rotation. The participants for the exercise include members of the unit control centers, initial responders, disaster control group, battlestaff, and the exercise evaluation team.

The primary objectives for this exercise are to practice all phases of major accident response—notification, response, withdrawal and recovery; exercise the unit accountability process (to include off-base travelers) for unit control centers; and

exercise the command and control tool to ensure effective processes are in place.

The most probable major accident response, an aircraft crash, is the basis for the first major accident response exercise. The wing leadership wants to ensure that they have a fully trained and functional response capability to deal with potential aircraft incidents in a combat zone with such a high operational tempo. A second exercise is conducted about halfway through the rotation to maintain proficiency for the response teams. During this exercise, the wing often focuses on a security response scenario. The wing leadership recognizes the need to be able to swiftly and effectively respond to a high security threat to the installation.

Host Nation, Joint, and Coalition Partnership Exercise Involvement

Whether the exercise is an aircraft incident, a security incident, or any other scenario, it is vitally important to include the host nation, Joint, and coalition partners in the planning and execution, in order to ensure effective response. The involvement is a good opportunity to crossfeed information and develop strong ties of mutual support. It also allows US forces to take advantage of the emergency response capabilities of all involved. This is a necessary and prudent precautionary measure to ensure we are ready for any unforeseen major accident response, both on- and off-base.

Guidance and Oversight

Supporting a readiness exercise program is difficult without a wing XP office to coordinate all the requirements, and to ensure all necessary details associated with planning and execution is complete. The need for a detailed exercise operating instruction is necessary to codify processes and procedures, and to

institutionalize them within the wing to provide the continuity from one rotation to the next.

Additionally, it is necessary to objectively evaluate performance during exercises and document the findings so corrective actions can be assigned and monitored for future rotations. The exercise evaluation team is used to objectively evaluate all phases of the readiness exercises, ensure compliance with the wing's major accident response operating instructions, provide a formal mechanism for documenting results of the exercise, and provide unbiased feedback on the readiness of the major accident response teams. The membership of the exercise evaluation team is functionally oriented around the processes for first responders, unit control centers, disaster control group, and the battlestaff. Members of the expeditionary communications squadron evaluate the TBMCS as well. Members of the Exercise Evaluation Team are most effective if each is at least a senior noncommissioned officer (SNCO) or officer with knowledge and experience in his or her squadron's functional areas of responsibility.

C2 Tool – Theater Battle Management Control System

The TBMCS serves as the wing's single command and control tool. Though the wing XP normally has the responsibility for overseeing the implementation and use of TBMCS, in absence of an XP at Al Udeid, EMSG took on this responsibility and developed a TBMCS implementation plan, later codified in an operating instruction, to provide the guidance and oversight, roles and responsibilities, and processes and procedures for use of the tool. Although painful during the spin-up phase, the tool proved to be highly effective in providing the necessary command and control for major accident response.



Checking Phone Lines in Preparation for an Exercise

Chapter 3 - Focusing the Squadrons

Perhaps one of the most difficult challenges in a contingency environment is developing a clear vision for the future. The purpose of focusing the squadrons is to set clear goals and expectations for the future, and to provide a common direction for all of the squadrons within a group. When all of the squadrons are headed in the same direction, mutual support yields synergies that otherwise would not be created. To start, we have to define priorities and then develop a long range plan. From there, we are postured to execute the plan and monitor progress.

Defining Priorities

Defining priorities requires that we understand the wing's priorities. In the absence of wing priorities, EMSG priorities were coordinated with the wing commander to ensure those priorities were congruent with his direction for the future. Going through

the effort of defining priorities was crucial to ensure limited resources were focused in the proper areas.

EMSG chose the following as its priorities, in order of precedence.

- *Mission*: provide maximum support to the warfighter
 - Maximize combat operations support
 - Institute processes to minimize rotational vulnerabilities
 - Implement processes to ensure rapid and effective disaster control measures
- *Quality of Life*: ensure the highest quality of life for our people
 - Ensure a safe and secure force
 - Communicate and enforce standards of good order and discipline
 - Provide creative and healthy morale programs and events
- *Infrastructure*: establish a healthy and safe working and living environment



379TH Personnel Performing Training on an All-Terrain Forklift

- Design, develop, and maintain safe and reliable infrastructure
- Implement enduring, long-term planning and execution processes
- Develop an executable and coordinated transition plan from tents to semi-permanent facilities, and from semi-permanent facilities to permanent facilities

Using these priorities, it was possible to develop a long-range plan for EMSG that articulated a vision and expressed executable action steps to achieve that vision.

Long Range Plan

Developing an executable plan results from answering four fundamental questions.

- Where are we now (baseline)?
- Where are we headed (commander's intent or vision)?
- How will we get there (long range plan)?
- Are we on track (measures of progress and success)?

Where Are We Now?

The first question baselines the organization by establishing a starting point. Answering this question allows the commander to define a starting point so he or she can better gauge progress toward achieving the desired vision. In other words, the commander needs to know the health of the squadron. As the path is laid out for the squadron, constant monitoring of the health of the squadron, relative to the direction the squadron is headed, allows the commander to verify if he or she is on the right track.

Measuring the health of the squadron involves evaluating compliance with expectations associated with mission, safety, training, personnel and manpower, facilities, resources, and funding.

How well a squadron supports the mission of the wing is the first order of business. A commander needs to clearly understand the mission of his or her squadron, so he or she can establish clearly defined measures of merit to determine if the mission is effectively executed. Each squadron should have its own set of metrics to measure mission performance. For example, some service-related support squadrons may want to measure customer response rates, or number of completed trouble tickets, over a certain period of time. Other squadrons may want to measure weapon system availability or support equipment readiness. Equipment turn-time, number of inspections completed, or scheduling effectiveness rates, may be additional measures of mission performance. Whatever the mission, a set of metrics

Chapter 3 - Focusing the Squadrons



Retreat Formation at Al Udeid Air Base, Qatar

should be developed to let the squadron commander know if the mission is being accomplished in an effective manner.

Compliance with safety directives is another important measure regarding the health of a unit. Unit safety program compliance, number of direct safety violations, or technical data violations are examples of areas that can be measured to provide a picture of the unit's safety program. Other useful measures may include tracking on- and off-duty injuries. Use of the Air Force (AF) Form 55 has been a long-standing method for documenting safety concerns for the squadron work centers. Even tracking compliance by use of AF Form 55 documentation can be a useful indicator of compliance within unit safety programs.

Training is another measure of a unit's health. Commanders are responsible for ensuring that people are adequately trained to perform the mission. Each must ensure that initial training, proficiency training, and upgrade training is accomplished in a timely manner. Examples of possible measurement areas may include training completion rates, overdue training, additional duty training, and percentage of personnel in upgrade or proficiency training, to include status of progress.

Personnel metrics are yet another measure of the health of a unit. Comparisons between authorized and assigned personnel validate whether the squadron has sufficient manpower to achieve its assigned mission. As was mentioned earlier, reviewing unfilled positions, mismatched positions, or training deficiencies for the new rotation is necessary to ensure shortages are identified and corrected. Equally important are the measures that indicate if we are taking care of our people. These measures include enlisted performance report (EPR), officer performance report (OPR), and letter of evaluation (LOE) monitoring to ensure they are being completed on time. The commanders should also review status of decorations to ensure timeliness, and to ensure deserving people are properly rewarded for their performance. Additional metrics may focus on percentage of personnel assigned to mobility positions, and a litany of measures to ensure positions are identified and equitably filled for AEF rotations as mission needs dictate.

Facilities are another excellent measure of a unit's health. Facilities are easily neglected if the commander does not take a personal interest. There are a number of ways to gauge the health of the unit's facilities. The commander should ensure all

facilities have a manager assigned and that facility discrepancy logs are used. The commander should frequently inspect facility safety reports and discrepancy logs to get a feel for the condition of his or her facilities. Additionally, the commander should insist on an upgrade plan or a long-range development plan. Finally, the commander should monitor status of discrepancies to ensure that they are being addressed in a timely manner.

Another important area to focus on when determining a unit's health is resources, in terms of equipment (test, support, and personnel protection), vehicles (special purpose and general purpose), tools and consumables. All of these have measures of merit that should be reviewed by leadership. Some examples include status of custodian authorization/custody receipt listing accounts, automated data processing equipment accounts and communications security accounts, availability or serviceability rates, and mission capability rates. Other examples may include repair rates, parts status, and storage levels. The commander has a responsibility for ensuring that his or her people are properly resourced to execute the mission. A significant amount of the commander's time should be spent breaking down barriers and working with resource providers to ensure sufficient resource support is available.

The final area that is a key indicator of a unit's health is funds management. As with resources, the commander has a responsibility to ensure that his or her unit has sufficient funding to conduct the mission, and must ensure procedures are in place to properly manage those funds. The measures of merit in this area can range from monitoring status of Form 9 submissions to tracking spend lines against obligations and authority.

Where Are We Headed?

This question addresses the long range vision of the commander. By addressing this question, a unit is able to provide an unambiguous and precise direction for the future. Articulating a common vision for EMSG was necessary to ensure all units were collectively headed in the same direction. The commander's intent set the destination and direction EMSG would collectively go as they planned for the future.

The commander's intent for EMSG had a threefold vision. First, was the development of an effective rotation management process. The issue centered on degraded mission support during the transition period of a rotation. The intent was to develop a seamless and efficient transition between AEF rotations with no degradation of the mission. Second was the development of an effective aerial port operation. Aerial port operations were problematic as were transient immigration, troop beddown and movement through Al Udeid Air Base. The intent was to develop efficient, customer-focused processes and support structures for moving people through Al Udeid Air Base during rotations while, at the same time, being able to provide an enhanced level of

support for rotational personnel at Al Udeid. Third was the idea of evolving to a more progressive enduring base operation. The main issues that drove this intent was the realization that constant changes in mission caused resources (personnel and equipment) not to be properly aligned with new missions. The intent was to develop a methodology to align these resources with mission requirements now and for the future.

It took 4 months to develop a clear understanding of the root causes of problems that plagued EMSG and the wing. It took a concerted effort to look beyond the challenges of daily operations in a high operations tempo environment, to identify where EMSG needed to be headed. It would have been easier to maintain the status quo and continue marking time, but that was not enough. As leaders, we were expected to provide forward-leaning leadership, even if it created additional workload for an already heavily-tasked group. By late October 2004, the vision was clear, and the time to develop a plan was at hand.

How Do We Get There?

In early November, EMSG leadership and squadron commanders met for a half day *offsite* and the group commander presented his intent. The purpose of the meeting was to explain the vision for EMSG and to task the squadrons to develop a plan on how they were going to achieve the vision.

The squadrons were given 2 months to develop individual long-range plans. Guidance for plan development required inclusion of measurable, obtainable, and actionable initiatives that mapped directly to each of the three vision statements (effective rotation management process, effective aerial port operation, and progressive enduring base operation). Each initiative had to have an office of primary responsibility, a target completion date, and ways to measure progress and success. The squadron plans were then rolled up into an EMSG plan.

How Do We Know We Are On Track?

The final step is to institute a process to review status and measure progress toward achieving the three vision statements. It is important to periodically monitor the health of each squadron to determine where to make course corrections and to ensure the squadrons are properly focused on the commander's intent.

A monthly *How Goes It* meeting was mandated for each squadron. This meeting was tailored to the unique characteristics of each squadron and included all of the measures of merit previously discussed in this section. Attendees included the group commander, deputy, chief enlisted manager (CEM), squadron commander, operations officer, flight commanders and flight chiefs. Each squadron presented the information differently, but with a common theme and focus that kept them all aiming for the same vision for EMSG.

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Chapter 4 - Leading the Troops

Personnel need reassurance that they belong to a fully functioning wing with a chain of command with full *Uniform Code of Military Justice* authority. It becomes important for senior wing leadership to get out in front of the troops early in the rotation and often. The new rotations need to know as quickly as possible what the wing leadership expects of them. A critical first step is to set the standards of expectation relative to behavior and performance. This is a big step in ensuring a smooth and successful rotation. This can be accomplished through Right Start briefings, commander's calls, and wing leadership being visible in the workplace and in the living areas.

Commander's Calls

Within EMSG, officer and SNCO calls were used to communicate standards and expectations. These calls were conducted separately, but with the same basic message. Each call had a clear and concise explanation of EMSG's mission in relation to the mission of the wing. It was important to help everyone understand how they contributed to the success of the wing's combat mission. Next, a discussion on safety emphasized the need for supervisory involvement on a 24/7 basis. Following safety, I discussed what I expected of my officers and SNCOs, and what they could expect from me, so we could start producing as a group. The officer and SNCO calls were mandatory for all rotational personnel. Permanent party personnel were not required to attend, but were highly encouraged to attend and often came on their own volition. The setting for the calls was structured, but informal. I wanted my leaders to engage with questions and comments to ensure that my messages were effectively being sent and received.

Visibility

Being visible is a necessary and important part of effective leadership in a deployed environment. It is important to let people see the commander out among the troops; to sit and listen to their concerns, to share his or her expectations, and help them better understand his or her concerns. Being visible reinforces the chain of command by letting people know who the commander is, and that he or she cares. The idea of *leading from the front* energizes personnel and drives them to perform well because they can better relate to the leader as a person, who, like them, is away from family and friends and is dedicated to doing his or her best to support the mission of the wing.

Letters of Evaluation

Another important part of leadership is taking care of the troops. One of the ways of doing this is to take the time to document

performance during the rotation. Within EMSG, it was mandatory that all personnel (officer and enlisted) be given letters of evaluation (LOE), except in cases where the deployed rater was also the ratee's rater at their home station. This was beneficial for the individual when it came time to consider them for an end-of-rotation decoration or when documenting performance for their annual performance report.

Decorations

Decorations are an important method for recognizing and rewarding outstanding performance. Because it is easy to abuse the system, a policy should be generated to provide guidance on submitting deserving personnel for such decorations. The main point of the policy should state that decorations will be submitted for those who clearly and distinctly perform in an outstanding manner that cannot be appropriately recognized in another way. Not everyone deserves a decoration, just because they deployed to the war zone. To preserve the value and meaning of the decoration and to recognize those truly deserving, it is important to only decorate those whose performance is exceptional.

When reviewing the decoration package, it is helpful to have a copy of the draft LOE in the package, along with any award submissions. This information helps to reinforce the comments in the citation, so that a more informed decision can be made by the reviewing officials.

Timing is also an issue with decorations. It is necessary to give the units sufficient time to develop decoration packages, while at the same time, ensuring that appropriate time is allotted in the review process to review all submitted packages. To achieve this balance, decoration guidance is provided to the squadrons halfway through the rotation cycle (60 days). At the 90-day point, decorations are submitted to the group level to allow sufficient time to review and rewrite as necessary. At the 114-day point, decoration packages are finalized and submitted to wing level.

At the end of the review process, feedback from the group level is provided to the squadron so the commanders can adjust their processes for the next rotation. This allows the commanders to see what has been approved, disapproved, and downgraded at the group level. It also provides a sense of how they did relative to other squadrons within the group.

Awards Program

Another important recognition program is the awards program. The mindset of some first line supervisors, however, is to focus on the mission and not spend time producing awards packages.

Therefore, it is important to insist on use of the program and ensure each squadron recognizes their best performers during each rotation. Within EMSG, the CEM managed the program and ensured fairness and timeliness of submissions occurred so sufficient time was available to recognize award winners, and document their achievements in their LOEs.

Managing the Staff

Another important area of leadership for the commander is managing the staff. The commander's immediate staff should include a permanent party deputy and a rotational executive officer, a CEM, a resource advisor, and an administrative assistant.

At EMSG, my deputy served as my *right-hand man*. We recognized early the importance of being in synch with each other and being mutually supportive on the day-to-day issues, as well as the long-term direction for EMSG. The deputy was assigned specific responsibilities to oversee the staff and troubleshoot problem areas that crossed multiple squadrons, groups, or tenant units. The deputy also served as a facilitator, ensuring that communications effectively occurred both up and down the chain of command, as well as horizontally among the squadrons. Last, the deputy had the responsibility of being an advocate for both the squadron commanders and the group commander. In this capacity, the deputy communicated information from me, as well as communicating information to me, when necessary.

A group commander must broaden the deputy's perspective with challenging responsibilities, listen to his or her advice, support his or her decisions, and document his or her performance on the performance report and the promotion recommendation form. The commander must take a personal interest and involvement in the deputy's next assignment. Although this requires time, along with documenting performance, it is the most important thing commanders could do for a well-deserving deputy.

The CEM is another key member of the staff and is assigned a number of responsibilities. The key task is to be well versed on the pulse of the enlisted corps. The CEM also serves as a troubleshooter and a manager of special projects. The CEM needs to be brutally honest and visible, communicating both to and from the commander, as the CEM interfaces with the troops. Furthermore, it is important that both the commander and the CEM be visible together. One of the ways to accomplish this is during weekly drive-arounds. At EMSG, during this time the commander and the CEM would not only inspect the base (to include working areas and living areas), but also spend time together to discuss morale concerns and other issues on the minds of the troops.

Chapter 5 - Managing Resources

One of the important functions of leadership is to ensure the troops have the resources necessary to do their jobs. Several initiatives should be put in place.

Manpower Review

At Al Udeid, a manpower review initiative was established to ensure sufficient manpower existed to support EMSG's many mission areas. The initiative was twofold in that it focused on near-term rotational issues and long-term sustainment issues.

A policy letter was published outlining the requirement for a rotational manpower review. Its purpose was to ensure manning documents were correct and discrepancies were captured, documented, and resolved. The Employee Requirements Manning Document was reviewed against the Deployed Requirements Manpower Document to ensure personnel assigned were consistent with the authorizations and grades, skill sets were correct, and deviations from line remarks were adequately addressed. Discrepancies were documented and elevated as necessary within the first week of the new rotation to ensure unfilled or mismatched positions were quickly and properly addressed. Likewise, training requirements were reviewed to ensure personnel filling a position were sufficiently trained to do their job. The EMSG CEM was assigned responsibility for ensuring a thorough group review was properly conducted. The CEM reported group results and results from each squadron to the group commander and deputy. Discrepancies outside the control of EMSG were elevated for corrective action to minimize repeats during subsequent rotations.

This effort generated significant concerns that the authorization documents were not keeping pace with the ever-changing mission needs of the installation. As the base matured, the base operating support mission and other missions were rapidly transitioning from a contingency focus to a more enduring operations focus. The manpower documents had not kept up with this change. For example, the expeditionary civil engineering squadron's heating and ventilation air conditioning flight was manned to support a contingency base operation using Harvest Falcon assets heated and cooled by large ground air conditioning units. The base had moved away from Harvest Falcon assets and was now using semi-permanent trailers. In total, the 136 dorms, with 30 rooms each, had a single small window air conditioner in each room. The heating, ventilation, and air conditioning (HVAC) shop was not manned to support maintenance of 4080 window units, much less the preventive maintenance measures needed to keep these air conditioning units operating. They were only manned to support the Harvest Falcon assets that had long been removed and replaced with semi-permanent facilities.

A complete revalidation of core manning documents needed to be accomplished to ensure authorizations adequately

supported the current mission. USCENTAF's A1 staff was asked to conduct a full-scale top-to-bottom manpower review to ensure authorizations supported the current mission taskings. This effort was initiated and found to be needed across the entire theater of operation. It was then performed on a frequent basis to ensure manpower was properly resourced to meet the current mission requirements. The AEF Center must be an integral part of this process to ensure AEF rotations are responsive to the needs of the units.

Equipment

Equipment was another resource area that required attention. Much of the equipment available at Al Udeid was old and obsolete. Some of the equipment was provided from stockpiles of war readiness materiel no longer used in the active duty inventory. Examples included communications gear and special purpose vehicles.

Personnel often arrived unfamiliar with equipment. Since the equipment was not available or used at the home station, it was not part of their training. Therefore, they were not able to generate a level of proficiency on the equipment before deploying.

We were limited on what proactive measures we could take to avert these problems. The squadrons were very resilient in figuring out how to adapt to equipment unfamiliar to their people. However, this must be recognized as a weakness in the AEF process. We must not expose personnel to this kind of equipment for the first time in a deployed environment. The learning curve is steep, and the risk of using old or obsolete equipment may prove to be too high, especially where safety and impact on direct mission support are involved.

Facilities and Infrastructure

Facilities and infrastructure growth was a monumental challenge at Al Udeid. During 2005, Al Udeid had facilities in three stages of disposal or development. The original tent city was torn down. Tents were either salvaged or disposed, and the land was reclaimed for return to the host nation. Semi-permanent trailers for the living compound and much of the working areas were either in place or being built, and permanent facilities were being designed and constructed. The permanent facilities were managed by Air Combat Command's (ACC) construction management office.

Development, upkeep, disposal of tent facilities, and semi-permanent trailer facilities kept the expeditionary civil engineering squadron more than busy. The tent facilities had been set up quickly during 2001 to meet mission needs. After being in the harsh desert environment for 3 years, these facilities were getting old and worn out. Electrical teams spent thousands of man-hours carefully monitoring and repairing primary and

secondary power distribution systems and boxes to avert power failures or fires. From a fire safety perspective, the tent facilities were not built for long-term occupancy. Structural teams, plumbers, electricians, and heating and cooling specialists spent inordinate amounts of time and resources repairing such things as leaky roofs, clogged toilets and plumbing, electrical power failures, and wind-damaged doors and windows.

To better manage this effort, an infrastructure utilization board process was put in place to more effectively manage all aspects of infrastructure requirements for facilities, roads, water, sewage, communications, and electrical work. This effort helped to guide and direct the many moving parts associated with managing the base infrastructure needs.

Additionally, the expeditionary civil engineering squadron led a base-wide development project to merge the many building and infrastructure programs from the wing, Combined Air Operations Center, host nation, and coalition partners into a single comprehensive 5-year development plan. This initiative brought together all the players in the development of Al Udeid Air Base to ensure a congruent and functional long-term development plan existed.

Funds Management

Although there was essentially no formal operational budget managed by the wing in fiscal year 2005, as commanders, we had a fiduciary responsibility to wisely and prudently spend our limited Global War on Terrorism funds. We also recognized that careful spending on our part gave the Air Force greater flexibility to execute its entire budget both at the home station and in the USCENTAF area of responsibility.

In absence of a budget, an initiative was put in place at the group level to control spending. Guidance was distributed in a policy letter mandating that every effort be made to avoid wasteful, inappropriate or unnecessary spending, and that all purchases be justified with an audit trail sufficient to satisfy a General Accounting Office review. Specifically, the policy directed that each squadron perform the following:

- Ensure all purchases were necessary, prudent, and limited to those needed to support mission operations
- Ensure resource advisors and other purchasing individuals kept an audit trail of all purchases
- Ensure excess supplies and equipment were inventoried, stored, and visible to other units for use as needed
- Ensure an effective squadron commander-level review process was in place to avoid improper or unnecessary expenditures

A two-part oversight plan was executed. First, each squadron was asked to establish procedures for regular oversight reviews to ensure compliance with the policy. At a minimum, squadron

Chapter 5 - Managing Resources

oversight assessments needed to include status reviews of purchases, pending deliveries, receipts, and payments. Secondly, Form 9 submissions were carefully scrutinized at the squadron commander level, and later at the group commander level when Global War on Terrorism funding was severely curtailed.

Base Appearance

Base cleanliness and appearance was a major concern when I arrived at Al Udeid. It was an indicator that provided an indirect warning sign of waning attitude, morale, and discipline. The logic was simple—if people cared little about their working and living environment, then they might care even less about their support to the mission. Additionally, it was important to ensure the base was presentable for the many dignitaries and distinguished visitors that passed through. It was only natural to want to present to others a clean and polished appearance of where we lived and worked. It followed, therefore, that if leadership paid attention to base appearance, others would do so as well. EMSG leadership, wing chiefs, and first sergeants put this logic into practice by conducting weekly walk-throughs and drive-arounds, varying the time of day and the areas they looked at.

This approach achieved several objectives. First, it allowed them to be visible. They would conduct their walk-throughs in uniform so others would know they were interested in the health and welfare of the troops. Second, they inspected the dorms and living areas to ensure standards of good order and cleanliness were maintained. They would develop a list of *discrepancies* and provide them to the dorm managers each week to work. The troops appreciated that senior enlisted leaders were concerned about their living conditions.

During each rotation, a half day was spent inspecting each of the 12 large bath houses and 6 smaller latrine buildings in Coalition Compound. When this initiative began, the bathrooms were in a poor state of repair, even though they were less than a year old. They simply required senior leadership attention to force others to take action. This worked well, and the bathrooms were then maintained in a good state of repair. It took direct leadership intervention to get the attention of the personnel using the facilities and the attention of the organization responsible for their upkeep.

The group chief and I also spent 2 hours each week driving around the entire base. We documented problem areas each week and tasked them out to the squadrons to resolve. This, too, worked well, and the squadrons recognized that we were serious about base appearance. Squadrons took initiatives to improve base appearance, and the expeditionary civil engineering squadron instituted base beautification efforts.

Dorm Management and Validation

A comprehensive validation of dorm rooms should be done with each rotation to ensure adequate numbers of rooms are available for assigned personnel and for transient populations. This is necessary because of the constant mission changes that drive significant fluctuations in forces assigned. This validation achieves two objectives. First, it ensures units have the correct number of rooms to meet mission needs for the current rotation. Second, to ensure fairness and equity, the validation serves to monitor compliance with installation room assignment policies.

Failure to comply can result in morale issues and space issues. At EMSG, morale was affected because of the perceived injustice when rooms were not equitably distributed among personnel. For example, airman through master sergeant, and lieutenants through major, were assigned two people to a room. If a unit did not comply with this policy, then it was being unfair to those units who did comply. There were exceptions, especially for flight crews requiring crew integrity, but these were explainable and accepted. Moreover, compliance with policy was necessary to ensure sufficient transient rooms were available during the periods preceding and during rotations. Limited room availability made it important to abide by occupancy policies.

Timing to start the validation process, typically, occurred 30 days after the official start of the rotation. Ideally, a validation would be done in advance of a rotation, but the AEF system was not able to identify personnel by rank or gender in advance with enough fidelity to conduct a validation prior to the rotation. The validation was therefore completed in the middle of the rotation, after the transition from one rotation to the next was completed.

The EMSG CEM worked with his counterparts from the wing and tenant units to conduct the validation and report adjustments to the group commander. The validation process took a great deal of time and was often very contentious among units. Many units were resistant to giving up rooms for fear the rooms might be needed at some point in the future.

Quarters Inspections

Quarters inspections are accomplished during each rotation to assess the security, military fitness, and good order and discipline of a unit. These inspections are also done to ensure compliance with maintenance standards and to monitor upkeep of living quarters. Even though the upkeep of the quarters is the responsibility of every member of each unit, it is the commanders who had responsibility and authority for ensuring compliance. Included in this authority is the ability to make an examination to determine if standards for sanitation and cleanliness are being met, and locating and confiscating unlawful weapons and other contraband. Just as a cautionary note, any such inspections should be conducted in a uniform manner with respect to all members of the unit.

For EMSG, the following activities were mandatory. Each squadron was expected to conduct a quarters inspection of every rotational member within the group at least once during the rotation. Commanders were to conduct a thorough inspection for excessive trash, dirt, dust, dirty laundry, and unpleasant odors. The refrigerators and metal lockers in each room were to be examined and any contraband seized. The squadron was to conduct the inspection with full cooperation and guidance from the staff judge advocate’s office. However, they were cautioned that quarters inspections were not a substitute for probable cause searches. If a commander suspected someone of an offense under *The Uniform Code of Military Justice*, he or she was instructed to consult with the staff judge advocate, prior to the inspection.

Organizing the Schedule

Establishing a routine meeting schedule was an important step in leading EMSG. At the command level, two routine staff meetings were conducted, one on a daily basis with the commander’s immediate staff, and one on a weekly basis with the commander’s immediate staff and squadron commanders.

Daily Status Update Meeting

At EMSG, the daily status update meeting was a quick 15-minute meeting with the deputy, executive officer, and CEM. The purpose of this meeting was to review status of mission critical systems, highlight issues that surfaced overnight, review the daily calendar, and discuss key areas of interest. A review of the day’s

calendar and activities with the staff was conducted to ensure all meetings were covered and ensure that each individual knew what the other was doing. We would then go through the read file, put together by the executive officer and senior administrator, who spent the first hour of their day assembling the read file for the meeting. The content of the read file included the force protection intelligence summary, a synopsis of force protection and intelligence summaries, messages, correspondence for the past 24 hours, the expeditionary security forces squadron blotter, and the expeditionary civil engineering squadron’s fire flight blotter. The read file also included a status update section on critical EMSG resources. This section would be used to generate a one-page stoplight summary slide of critical systems (shown in Figure 2) which was then presented at the daily wing stand-up. Supporting documentation showed resource status for critical communications systems, force protection and security systems, special purpose vehicles, infrastructure status associated with power, water and sewage, and finally, status of explosive ordnance disposal (EOD) and fire equipment.

Other sections of the read file included the daily flying air tasking order, aircraft maintenance status, mission capable (MICAP) boards, wing suspense slide, and the daily distinguished visitor schedule. Last, the read file included a quick reference section containing current battlestaff directives, the latest rotation schedule, and the weekly PERSCO strength report. Typically, it took approximately 15 minutes to preview the read file in preparation for the meeting. Questions generating from this preview were the basis for discussion during the actual meeting.

Weekly EMSG Staff Meeting

The group staff meeting served as a time to exchange information and to provide status updates on various issues among the squadrons and group. They were specifically focused on sharing information, and not solving problems. Generally, the meetings lasted approximately 90 minutes, which provided adequate amount of time for each squadron to address taskers, issues, and any upcoming events. With time permitting, additional meeting topics included administrative actions and the passage of communications from previous wing-level meetings.

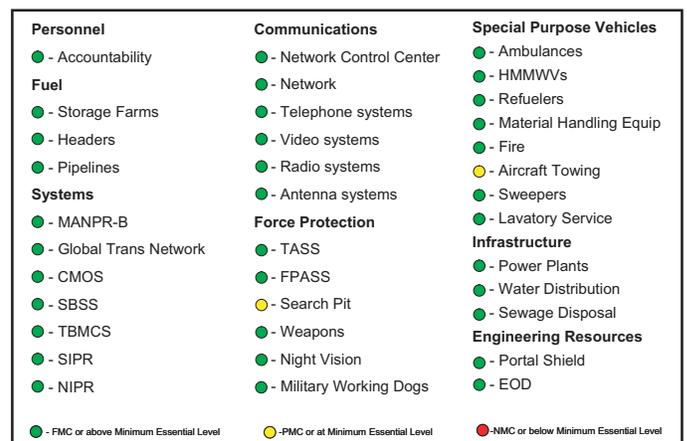


Figure 2. 379 EMSG Resource Status Update

Chapter 6 - Guiding the Rotation

Guiding an AEF rotation requires a perspective different from that needed to lead an organization at home station. Continuity is a critical component of success from one rotation to the next. This continuity helps to ensure the mission continues as personnel transition between rotations. To be successful, commanders should ensure that the standards of performance, processes, and expectations are passed between rotations. This is especially difficult under an AEF rotation, when only slightly more than 1 percent of the squadron, group, or wing leadership remains from one rotation to the next. In some locations, there is little or no command continuity between rotations. In either case, commanders should establish processes to ensure continuity exists within their squadron. These processes may include such things as communication (for example, communicating often, clearly, and simply to ensure careful planning, execution and followups are accomplished. As a general rule, the commander will want to keep processes simple from one rotation to the next.

Split Shift Operations

For EMSG, the first of these initiatives was to ensure maximum leadership availability and presence during the actual transition period between rotations. The group commander and deputy split up during this time to ensure one was on duty during the peak transition periods.

The group commander's core duty hours were 0600 to 1800. These hours were dedicated to monitoring rotational activities and focused little on other duties that removed him from the core rotation mission. Those types of duties were accomplished after his shift was completed. The deputy's core duty hours were 1200 to 2400. This provided 6 hours of coverage overlap, allowing a cross flow of communications between the deputy and the group commander. The deputy's duty hours also provided group leadership coverage during peak afternoon and evening operations, especially during high volume rotator aircraft arrival and departure times. Split shift duties ensured all rotator operations (arrival, billeting, food, weapons storage, customs, immigration, and initial PERSCO processing) had senior leader oversight to ensure smooth and consistent flow, and to address and resolve any immediate issues.

Hot Wash

An end-of-rotation hot wash was institutionalized in EMSG to capture, document, and put in place any fixes to problems from the previous rotation. With permanent party commanders, a hot wash was done early in the new rotation (or late in the rotation for rotational commanders) to capture the issues while they were still fresh in their minds. This hot wash served several purposes.

First, it provided a forum to communicate issues up and down the chain of command. This was necessary to ensure that all levels were aware of the issues and that solid fixes were in place. Second, it provided a forum to assign ownership and suspenses for those issues that either were not in a unit's control, or spanned across several units within an organization. Last, hot washes served as a historical record to capture the issues and record what was done. Such documentation helped to feed higher level hot washes (USCENTAF or AEF Center) and could be used for AEF planning sessions for subsequent AEF rotations.

Over the course of the year at Al Udeid, the hot wash process improved after each rotation. In the end, the hot wash covered airlift issues (rotator schedule, seat availability, onward movement issues, issues with movement back to the states, and issues with in-theater airlift), base operating support issues (lodging, food services, transportation, weapons storage, mobility bag issues, reception control, and PERSCO in-processing and out-processing), and issues outside the wing's control (host nation entry, exit, customs, air mobility squadron concerns, compliance with reporting instructions, and so forth). The hot washes were orchestrated and led by the deputy group commander and concluded with a report to the group commander.

Continuity Books

The use of continuity books is an essential element for long-term continuity among AEF rotations. Most units had used continuity books in some fashion during earlier rotations and understood the concept and why they were necessary. We found, however, that understanding the concept and putting it into effective practice were not always congruent with one another. Too often, people had to be forced to develop and use continuity books. The permanent party commanders became staunch believers after living through one rotation where the continuity book program was not effective. It also became clear at the group level that a set of standard minimum requirements was necessary to ensure an effective program existed within EMSG.

The EMSG CEM (a rotational position) had the responsibility for managing the program. The program was put under his care to ensure a common, consistent program was in place and used across the group. Additionally, the CEM was a logical choice because it got the CEM engaged quickly in the squadrons where a solid network of SNCOs existed to cross-flow information. The CEM also related more easily to the SNCOs who worked the programs at the squadron, flight, and element level. During each rotation, the CEM was formally tasked with ensuring compliance, thoroughness, and standardization. As the group commander, I wanted to ensure an effective continuity book program not only existed at every command level within EMSG, but that the program was actually being used. The books had to be

comprehensive enough on the one hand, yet be easy to use and follow on the other. The CEM would cross-pollinate good ideas among the squadrons and identify weak programs to the necessary level of authority for corrective action. Standardization was necessary to ensure minimum required information was passed from one rotation to the next. Such information included tasks, OPR, telephone numbers, location, points of contact, and the like.

Conduct and Behavior

Establishing standards of conduct and behavior was necessary at Al Udeid Air Base to maintain good order and discipline. These standards served to help protect people from getting into trouble during the rotation. They were particularly important in governing conduct and behavior in the living compound during off-duty hours.

The wing senior leadership was cognizant of the need to keep standards to a bare minimum. Standards were a major issue with the troops, especially when it came to mandatory wear of physical fitness gear when not in uniform, alcohol consumption policies, and mixed genders in dorm rooms. Because of the sensitivity of these issues, leadership established standards of conduct and behavior only when necessary. The standards were communicated clearly and often, and were applied and enforced fairly for all. When this didn't happen, standards were perceived as harassment.

Getting the word out early and often was necessary to prevent bad habits from developing in the absence of clear-cut standards. Standards were broadcast in a number of ways. They were explained to personnel who were getting off the planes, at Right Start, at commander's calls, and at roll calls. They were often printed in the base paper as well. The internal website had access to the *Coalition Compound Management Plan*, and supervisors were encouraged to know the standards and help with the enforcement.

Enforcement was everybody's business. Supervisors, first sergeants, chiefs, and commanders were all expected to know the standards of conduct and behavior. Furthermore, they were expected to set examples, and enforce compliance when necessary. Often, it was necessary to take quick and decisive action if standards were not being followed. Commanders were constantly tested by the troops on whether or not they would enforce the standards.

Leadership didn't always get it right the first time. When changes were necessary, we found that they were far easier to implement when put into effect between rotations. The changes were more easily accepted by the remaining personnel (since they were soon to leave), and for the arriving personnel, the changes were considered *already in place*.

Behavior Cycle of a Rotation

There were some interesting behavioral dynamics that occurred during a rotation. These dynamics are referred to as the behavior cycle of a rotation. Generally, during the first month of a rotation, personnel were *raring to go*. They were enthusiastic, energetic and highly motivated. They were also impressionable and could be more easily molded to fit the expectations of the wing commander. It was important to note, however, that they were also going through a steep learning curve in trying to adjust to the many changes within their new environment.

During the second and third months of the rotation, personnel *hunkered down* for the long haul. At this point, they considered themselves *seasoned vets* and it was smoother sailing now that they had adjusted to their new environment. During this period, there were relatively few problems with discipline or with knowingly violating rules of behavior. Personnel remained focused on getting the job done.

The fourth month of the rotation always proved to be a bit more challenging for supervisors. Personnel were tired and anxious to go home. Supervisors worked hard to constantly remind their folks to stay focused on the mission. However, silly and inattentive mistakes occurred and discipline problems increased—especially violation of standards. Additionally, this time period became the highest risk for an incident to occur. However, simply knowing that these dynamics existed and instituting common sense risk mitigators helped alleviate many of the problems.

Maintaining Your Sanity

Perhaps one of the most important focus areas for a commander is to ensure that he or she does not burn out. Commanders need

to find a balance between duty and off-duty activities. A common analogy often used to stress the importance of striking a balance is to remind ourselves that we were in a marathon and not a sprint. As commanders, we must stay healthy, fresh, and alert. All work and no play, or an imbalanced workaholic approach, is not healthy for the commander, for the unit, or for the mission. It is, therefore, important to find a way to relax and reduce stress. Routine helps, but is too easily turned into a work-eat-sleep cycle with little or no room for recreation, or other necessary elements of a healthy lifestyle.

Balance, as it relates to physical well-being, emotional stability, and mental alertness, is absolutely crucial. Making a balanced lifestyle a priority is an important first step. A healthy lifestyle keeps the commander energized, while presenting a positive, aggressive, and confident image for others to emulate. If you don't take care of yourself, it is hard to ask others to take care of themselves. In a deployed environment, this is an essential survival tool.

It is often important to demonstrate to your folks that you are human, as well—that you enjoy yourself and those around you, and you don't mind laughing at yourself every once in a while.

In the area of physical fitness, the key to success is to make it a priority by scheduling it first and then not deviating from the schedule except when absolutely necessary. The commander must make physical fitness as a high priority in order to keep up the pace and to set the example for his squadron commanders.

The same applies to your emotional life. You have to make it a priority as well. Practice your faith as you see fit, and spend time communicating with your family. These areas are easily neglected or tend to take a lesser priority as you strive to stay ahead of the day-to-day activities. It is important not to let your emotional life fall by the wayside at the expense of getting another tasker completed.

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However much we succeed in transforming our logistics processes, there will continue to be a tension between efficiency and effectiveness. A just-in-time philosophy built around a responsive and agile supply pipeline, a minimum deployment footprint and extensive host nation support, may not always provide the resilience needed to sustain military capability.

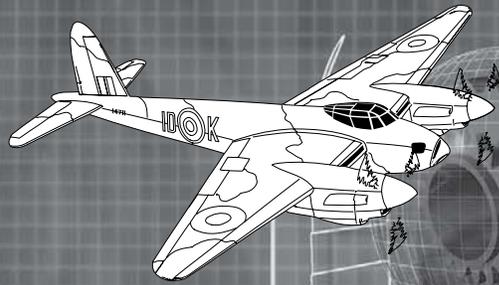
logistics and doctrine

Sustaining Airpower: The Influence of Logistics on RAF Doctrine

This edition's featured article was written by Air Vice-Marshal Peter J. Dye. Marshal Dye, over the years, has been a frequent contributor to the Journal. He is an accomplished military officer and logistician. In "Sustaining Airpower: Influence of Logistics on RAF Doctrine" Marshal Dye explores how the question of sustainability has influenced British thinking on airpower. He also explores the often-troubled relationship between support activities, particularly logistics, and the delivery of military capability. The article touches on organizational and cultural issues, and considers how current

paradigms may change with the increasing focus on expeditionary warfare and the development of network-enabled capability. Royal Air Force (RAF) organizational structures and their associated processes continue to reflect the arrangements developed during the Second World War. The emphasis on infrastructure, the heavy investment in equipment and the high ratio of support to combatant personnel have been defining characteristics of the RAF for nearly 90 years.

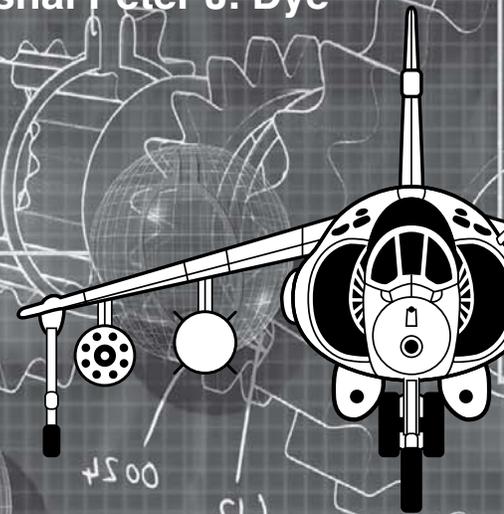
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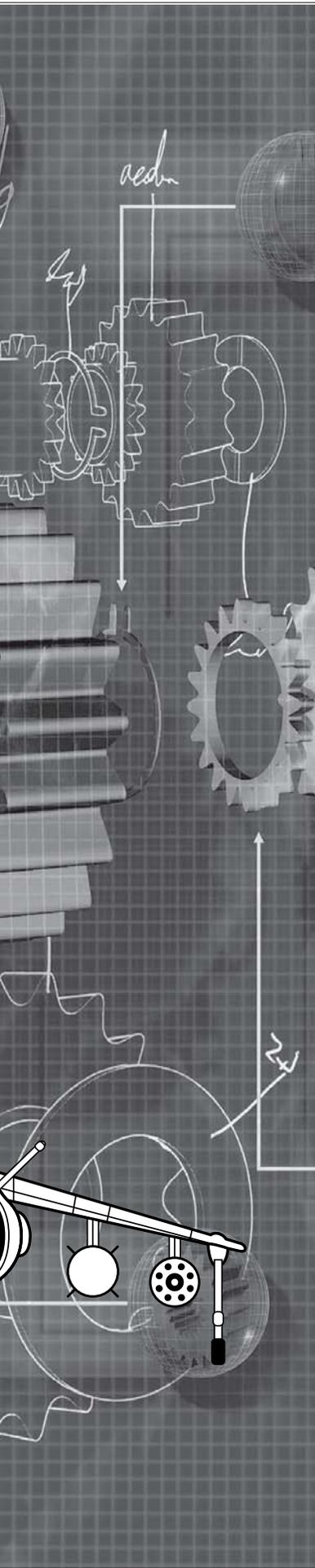


Sustaining Airpower

Influence of Logistics on RAF Doctrine

Air Vice-Marshal Peter J. Dye





Introduction

In 1942, Sir Frederick Sykes, the first commander of the Royal Flying Corps (RFC), and later chief of the Air Staff, briefly outlined how the motto, *Per Ardua ad Astra* (Through Adversity to the Stars), had been selected. Although he noted that some thought it bad Latin, he did not choose to elaborate on why it was the *best possible choice*.¹ For Sykes and his contemporaries, the reasons would have been self-evident. The RFC had emerged in the face of institutional hostility, interservice rivalry, political indifference, and significant technical and environmental challenges. The struggle to master the air had exacted a heavy price. The ethereal (the heavens) had been gained through human (mortal) effort. But, there was perhaps an even deeper message—the paradox that was the aspirational nature of airpower and the laborious, sometimes mundane and frequently complex arrangements needed to support military aviation. Thus, while the bravery and dedication of those individuals who helped to create the RFC were not in question, it was evident that the freedom of the skies (and the boundless military potential they offered) was in stark contrast to the fragility (often literal) of powered flight.

**Special
Feature**

This article explores how the question of sustainability has influenced British thinking on airpower. It explores the often-troubled relationship between support activities, particularly logistics, and the delivery of military capability. The article also touches on organisational and cultural issues, and considers how current paradigms may change with the increasing focus on expeditionary warfare and the development of network-enabled capability.

Sustainability and Logistics

Logistics and sustainability are not the same thing, although there is sometimes an implication that they are. Strictly speaking, sustainability is the “ability of a force to maintain the necessary level of combat power for the duration required to sustain its objective.”² Logistics, as the science of planning and carrying out the movement and maintenance of forces, clearly contributes to sustainability, but then so do training, intelligence, planning, and a wide range of other support or enabling activities that are certainly not embraced by the term *logistics*.

Sustainability is now properly regarded as a *principle of war* and, while logistics activities are hugely important in contributing to this core capability, they are subordinate to this end, together with the associated support strategies and organisational arrangements.

Enabler or Impediment?

Military aircraft spend much of their working lives parked comfortably on the ground, protected from the very elements that they supposedly conquered at the turn of the twentieth century. It is not just gravity that keeps them there. The cost, complexity, and effort needed to sustain military aviation are considerable. Air forces have learned how to manage these activities by focusing on process and organisation, but there remains a suspicion that the logistician is as much an impediment as an enabler in the delivery of airpower. For example, does the supply chain drive the machine forward or drag it back? Current sentiment seems to prefer the latter perspective. The popular press certainly seems unable to employ the word *logistics* without the juxtaposition of *failure*, *shortage*, or *crisis*.

These views are neatly encapsulated in Hoffman Nickerson’s observation that “*Airpower is a thunderbolt, launched from an eggshell, invisibly tethered to a base.*”³ Dramatic effect is balanced by a sense of fragility while still leaving one to wonder whether the tether should be viewed as an umbilical or as a brake.

Organisational Egg or Doctrinal Chicken?

To address the question of how sustainability has influenced British thinking about airpower we need first to confront the conundrum of what came first, the doctrinal chicken or the organisational egg? The widely used Doctrinal Development Model suggests that the process is best seen as a continuous loop, linking doctrine, output, feedback, and input. While this may be an entirely adequate concept,

Article Highlights

The logistics systems deployed by the RAF in both World Wars, and throughout the Cold War, were more than effective—they were winning solutions. These successes should be built on while seeking better ways to meet today's needs. Caution and a degree of humility are called for rather than a relentless dash for the new and untested.

Royal Air Force (RAF) organizational structures and their associated processes continue to reflect the arrangements developed during the Second World War. The emphasis on infrastructure, the heavy investment in equipment and the high ratio of support to combatant personnel have been defining characteristics of the RAF for nearly 90 years.

Air Vice Marshal Peter J. Dye postulates that expeditionary warfare and network enabled capability may be about to shift this particular paradigm. *The End-to-End Logistic Study*, now known as the Logistic Transformation Programme (LTP), and continuing work on station (base) structures offer the prospect of a significant change in the way the RAF is organized. Expenditure on logistic support and on the procurement of aviation and aviation-related equipment continues to represent a significant proportion of the UK defense budget.

According to Dye, the RAF will see fewer uniformed support staff with some functions no longer carried out at station level—and many no longer under the control of the station commander. The four lines of maintenance and repair seen in the RAF for over 50 years will disappear. The effect will be to dilute the status of the station in the overall organization with a greater emphasis on force elements as the RAF's center of gravity. Dye goes on to note that the RAF may need to *unpick* the Binbrook model. The difficulty will be to sustain ethos with the RAF logistics community while creating a more agile and adaptable organization. The basic building block in the new construct may well be the squadron, if not the flight, rather than the station.

The logistic problems faced by the RAF in Iraq are less about quantity and quality, and more about availability. The continuing concern about the inability in the RAF to track individual items, and the debate

it does beg the question of what came first? My personal view is that logistics processes have so dominated the delivery of airpower that doctrine has largely followed in their wake. This is as true today as it was when the Royal Air Force (RAF) was created.

The First World War

On the morning of 7 April 1918, with the airfield at La Gorgue shrouded in heavy fog and the German army advancing, Major Chris Draper ordered the burning of all 16 Sopwith Camel fighters belonging to No 208 Squadron, RAF. Two days later, the squadron had relocated to Serny, over 20 miles to the west, and was actively engaged in the continuous air operations that sought to halt the German march offensive before it could threaten the channel ports. As the squadron commander later recalled, "It says a lot for the supply depots that we got our full complement of 20 new machines within 48 hours."⁴

This small incident, in a long and intensive war, provides some indication of the scale and effectiveness of the logistics system that underpinned the British air effort on the Western Front. The value of the machines burnt at La Gorgue represented £5M at today's prices, yet new aircraft were available almost immediately, as were the technical personnel, ground equipment, spares, fuel, ammunition, vehicles, tools, repair facilities, and hangarage needed to support a frontline squadron.⁵

The First World War and its aftermath largely shaped the twenty-first century. In scale and intensity it was quite different from any other war previously fought. It was also a conflict in which technology dominated events to an unparalleled degree. John Terraine has observed that "the Great War was from the beginning the greatest war of technical innovation ever fought," adding that modern wars had become - as a war of masses with modern weapons sustained by modern mass production - "a matter of organisation and specialist skills in all the complex areas of logistics."⁶

It is arguable that the most complex logistics challenge was faced by the air services as they sought to realize the potential of airpower. Over recent years there has been a gradual recognition of the immense and sophisticated efforts needed to sustain the Western Front, as part of a more balanced and dispassionate analysis. The air war has not attracted the same level of interest, let alone controversy, even though it presaged the great air offensives of the Second World War. In fact, there has been a remarkable lack of debate about how, in a matter of a few years, a pre-war novelty was turned into a weapon capable of influencing the course of battles and ultimately war itself.

Between 1914 and 1918 the air arms of all the major belligerents, with the exception of Turkey, underwent a revolutionary transformation, but none more so than the British Air Services. By the Armistice, the RAF possessed 22,171 aircraft and boasted a total strength of 274,494 personnel compared to the RFC and Royal Naval Air Service combined strength of 270 aircraft and 2,073 personnel on the outbreak of war.⁷ The RAF also possessed, according to the author of a post-war study, the most fully developed system of aviation supply amongst the allies.⁸

There is some danger, however, in focusing just on the gross number of aircraft. It masks a fundamental characteristic of airpower—the high ratio of support to operational activities. If

Article Highlights

the frontline squadrons were the RAF's cutting edge of the spear, the shaft represented the greater part of the weapon. Of the 22,171 total aircraft, just 6,740 were assigned to operational duties (including the Western Front, home defence and antisubmarine activities). However, only 2,896 could be regarded as effective (13 percent of those on charge)—the remainder being held in store or under repair in theatre. At any one time, a further 10 to 15 percent were unserviceable, leaving just 2,500 aircraft to be employed on active operations. While much of the difference is explained by the need to hold significant reserves against attrition, the number of operational aircraft was unquestionably modest compared to the total inventory (see Figure 1).⁹ The scale of the resources needed to sustain this frontline (equivalent to some 200 squadrons in 1918) was unprecedented. Indeed, the national effort was substantially larger than the total uniformed strength of 274,494 implies. When the civilian labour involved in aircraft and aeroengine production, provision of spares and repair is taken into account, the number of personnel required rises to around 630,000 (including trainees, instructors, and support staffs).¹⁰

By the Armistice, the total cost to the nation, in materiel and human terms, amounted to the equivalent of £200M per year, or 4 percent of the United Kingdom's gross domestic product (GDP). Daily expenditure on the RAF had reached over £0.5M, or 7 percent of Britain's total daily war expenditure (see Figure 2). This was set to rise still further with some £165M of outstanding aviation orders, more than half the production commitments of the Ministry of Munitions, at the time of the Armistice.

The result of this huge investment was the production each month of an average of 4,000 aircraft, 3,900 aeroengines (including those repaired or rebuilt), 1,200 pilots, and 3,000 other ranks. Without this effort, average monthly losses of 2,200 aircraft and 3,000 aeroengines (written off and damaged), and some 800 to 900 pilot casualties would have rapidly curtailed operations.

The logistics system embracing these varied activities had few, if any, parallels in history. By the Armistice, the RAF's technical inventory comprised more than 50,000 separate line items. No business ever had to manage a stock holding of this size or complexity—a challenge made all the more difficult by the delicate nature of much of the equipment and spares involved, rapid obsolescence, and high modification rates.

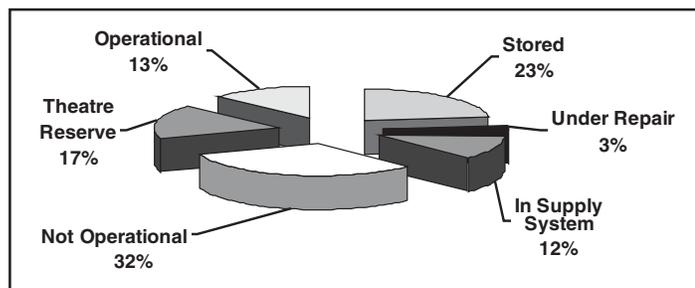


Figure 1. RAF Aircraft Dispositions November 1918

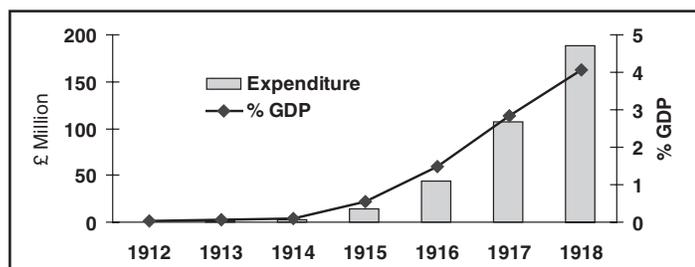


Figure 2. Aviation Expenditure 1912-1918

about *precision-guided* logistics, presage fundamental changes in the way that supply chains and logistics will be managed in the future.

Dye believes it likely that the RAF will gradually see a transition from a supply chain, built around a hierarchy of organizations, to a distributed network that can respond rapidly to changes in demand.

Dye warns that we must be cautious about what can be quickly achieved. He notes the RAF has toyed with serial number item tracking for at least 30 years and has a vast inventory, support processes, and policies tied to legacy weapons systems. Much as the RAF might wish to move from supporting platforms to supporting military effect, there is a limit to what can be done with our older assets.

The distinguishing characteristics of aviation logistics, as compared to defense logistics in general, are likely to diminish with time as all military equipment becomes more complex and support systems more sophisticated and interdependent.

As warfare moves from the industrial age to the information age, there will be fundamental change in the nature of logistics. Success will be measured by the adaptability of the support organization rather than by its scale or scope. If nothing else, this threatens to transform the relationship between airpower and sustainability that has held sway for nearly 90 years. However, no matter how much logistic processes are transformed, there will continue to be a tension between efficiency and effectiveness. A just-in-time philosophy built around a responsive and agile supply pipeline, a minimum deployment footprint, and extensive host nation support, may not always provide the resilience needed to sustain military capability.

Editors Note: British English vice American English spelling has been retained in this article.

Article Acronyms

- GDP - Gross Domestic Product
- LTP - Logistic Transformation Programme
- MAP - Ministry of Aircraft Production
- RAF - Royal Air Force
- RFC - Royal Flying Corps
- RUSI - Royal United Services Institute
- UK - United Kingdom

Organisational Implications

The First World War demonstrated that sustaining an effective air force required significant economic and industrial power allied to a large and complex support organisation. It is not surprising, therefore, to find that the level of increase in resources committed to the air services was significantly greater than to the Army (see Figure 3). Trenchard's strategy of the *relentless and incessant offensive*¹¹ was only tenable because the necessary human and material resources were made available.

It was known before the war that the arrangements needed to support military aviation possessed quite distinct characteristics. Sefton Brancker described, in June 1914, how the difficulties of maintenance were sometimes lost sight of, and that the fragility of aircraft, the need for repair and large quantities of spares, together with the difficulty of supply meant that "only a small proportion of the aeroplanes in the field will be fit to take to the air at any given moment."¹² In fact, sustainability was a major consideration in the decision to standardise on the squadron as the basic organisational building block for the RFC and, ultimately, for the RAF.¹³

Wastage rates were high as a result of accidents and low reliability, as much as from enemy action. This demanded a constant stream of replacement aircraft and aircrew. The disparity between new production and supply, particularly in aeroengines,

Thus, the expansion of the RAF from 1934 onward, although overtly dominated by the need to match the Luftwaffe's frontline, also sought to provide the resilience needed to fight a modern war.

meant that salvage, repair, and maintenance made a significant contribution to sustainability. Obsolescence, design and manufacturing shortcomings, and shortages in critical equipment meant that a high level of modification and rework had to be undertaken in the field. A wide range of special equipment, tools, and a myriad of individual parts and components needed to be readily available to the frontline squadrons to support these activities, as well as routine maintenance—under the constant threat of a short-notice move. The result was an extensive ground organisation, employing large numbers of skilled and semi-skilled personnel, underpinned by a supply chain that stretched from the frontline, via the repair depots and air parks, to the factories at home.

Aircraft and their component parts largely populated the supply pipeline, together with a constant flow of technical information, spares, equipment, and personnel. Unlike traditional military logistics systems, it was not dominated by a one way flow of consumables but by scarce, high value items that moved to and from the frontline in a constant cycle of replacement, salvage, and repair.¹⁴ As a result, noncombatants greatly outnumbered combatants. This was no subtle shift in the balance of roles, but a steep change in the *teeth-to-tail* ratio. Thus, of the 51,000 RAF uniformed personnel serving in France by November 1918, only 8 percent were classed as combatants (pilots, observers, air gunners, and so forth) while the majority, some 29,000 (57 percent) were technicians. By comparison, 896,000

personnel (65 percent) of the British Army were classed as combatants (see Figure 4).

The other defining feature was the balance of expenditure between personnel and equipment. During the course of the war over 50,000 aircraft were delivered to the British Air Services, of which only 36 percent remained on charge by the Armistice (see Figure 5). In 1918, squadron frontline establishments were replaced on average every 2 months. Notwithstanding the importance of repair and salvage in helping to recycle aircraft, aeroengines, and components, huge sums had to be committed to sustain the frontline. Throughout the war, between 50 and 60 percent of the budget allocated to the British Air Services was expended on equipment (see Figure 6).

In summary, the RAF was created around a system of interlinked and interdependent logistics activities that moved high value materiel continuously backwards and forwards at a tempo determined by daily attrition, combat operations, and technological advances—John Frederick Charles Fuller's *constant tactical factor*.¹⁵ It was a system unprecedented in both scale and intensity. Moreover, the efficiency and effectiveness of these arrangements directly governed the degree to which air power's potential could be realised. In this sense, logistics acted as air power's *lifeline* and, in so doing, established a dependency that has lasted for 90 years.

The Creation of the Royal Air Force

Concerns about sustainability also provided the catalyst for the creation of the RAF. The political imperative for an offensive air strategy and secure home defence could only be realised by the deployment of substantial national resources and closer military-industrial cooperation. The Joint War Air Committee formed early in 1916 (and the subsequent Air Board) were direct responses to the squabbling between the Services over the supply of aircraft and engines and the self-evident need to set priorities for the allocation of aeronautical material. Inasmuch as this established a favourable environment for an independent air arm, it may be claimed that the RAF was created as a structural solution to the wartime problem of maintaining an adequate supply of aircraft and aviation personnel.

Strategic Bombing

The creation of the Air Board and the more effective direction of production under the Ministry of Munitions saw significant improvements in sustainability. Indeed, the expectation of a surplus in aircraft and aeroengine production by the end of 1917 led directly to the creation of the Independent Force intended to attack military and strategic targets in Germany. In the event, the full increase in production was not achieved but by then the Independent Force had been created to employ the notional surplus of men and machines. Eventually, some 10 squadrons

out of the planned 40 were formed. Even if the numbers employed fell short of those planned, and the operational results lacklustre, the experience had a profound influence on RAF doctrine. Thus, an optimistic view of sustainability in 1917 led to the RAF's first steps in strategic bombing and, ultimately, to the Second World War's combined bomber offensive.

The First World War Legacy

I have laboured the point about the interdependence of airpower and logistics because the nascent RAF, at an organisational level, was designed around the support arrangements needed to sustain operations in war. While there was no *lessons identified* process, the central role of logistics in the delivery of airpower was widely recognised and understood. Air Commodore Robert Brooke-Popham, lecturing shortly after the end of the First World War, stated that,

It is, therefore, of the highest importance that spare machines and spare parts of every sort shall be instantly available. This means large base depots and an efficient channel of supply between depots and squadrons and on the sound working of this supply system the efficiency of the Air Force in any theatre of war very largely depends.¹⁶

In the years that followed, Trenchard sought to construct (literally) an air force worthy of the name. The RAF Cadet College and the RAF Apprentice School were the most obvious elements in this strategy, but they were part of a wider programme that enshrined a logistics-centric view of airpower based on a substantial investment in support activities. Speaking in 1944, Trenchard recalled that,

When we originally formed the Air Force in those days we were told that we were spending all our money on bricks and mortar, and on ground staff and ground personnel. In fact ... it was called *the Ground Force* and I believe I was myself once described as *General Officer Commanding Ground Force*.¹⁷

The importance attached to organisation and process was reflected in the RAF War Manual. "Under the modern conditions in which fighting services are called upon to operate, victory inclines to the force which is most thoroughly and efficiently organized."¹⁸ A recurrent theme in pre-war planning was the high wastage that war would bring. In a paper on *Some Problems of a Technical Service* read at the Royal United Services Institute in 1934 (with Air Marshal Sir Robert Brooke-Popham in the chair), the author stated that the average life of an aircraft in war would be 2 months—based on First World War experience—and that large reserves and high production rates were essential, underpinned by long preparation and skilled repair personnel.¹⁹

Thus, the expansion of the RAF from 1934 onward, although overtly dominated by the need to match the Luftwaffe's frontline, also sought to provide the resilience needed to fight a modern war. This was not a policy of quantity over quality, although there was some criticism (from even within the Service) that there were dangers in pursuing the mass-production methods employed in the First World War.²⁰ By and large, new technology was successfully introduced while substantially increasing the size of the frontline and the supporting reserves, consuming some 36 percent of the rearmament budget in the process (see Figure 7).

The result was a vast array of depots and maintenance units, specialising in storage, repair, salvage, and armament, that had no parallel in the Luftwaffe where the doctrine of a short war

negated the need for investment on a similar scale. Thus, over a period of 20 years the home-based RAF had been transformed from what was largely a training organisation based around grass airfields and temporary accommodations to a permanent system of stations and maintenance units that would provide the fighting platform for both defensive and offensive action.

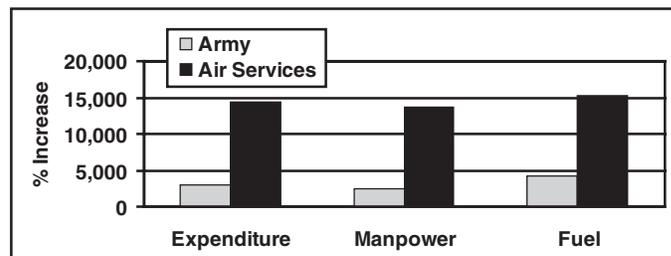


Figure 3. Relative Increase in Military Resources 1914-1918

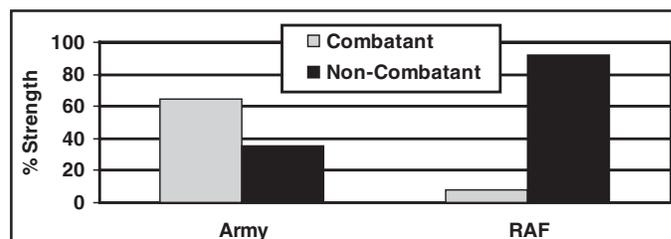


Figure 4. Relative Proportion of Combatants - France 1918

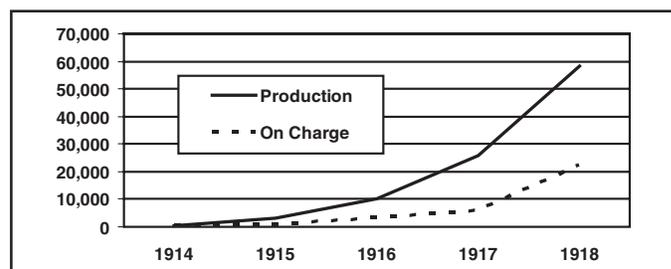


Figure 5. Aircraft on Charge - British Air Services 1914-1918

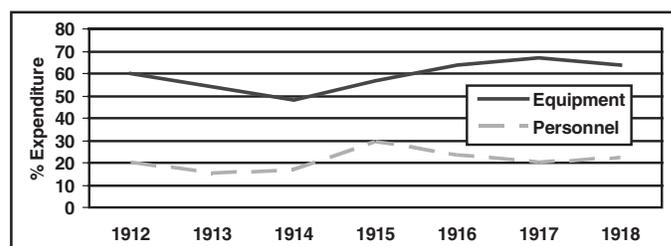


Figure 6. Air Service Expenditure by Category

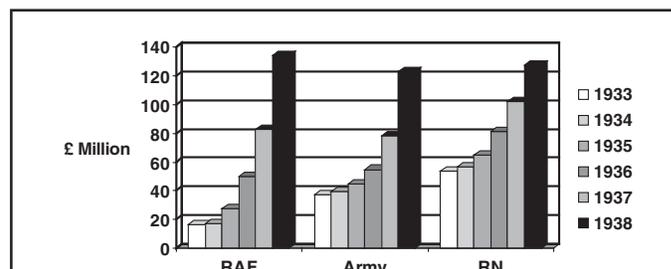


Figure 7. Comparison of Annual Defence Expenditure 1933-1938

The impact of this change was deeper than might be imagined, as it touched on that most intangible of issues—ethos and culture. The station became not only the key element in the exercise of command and control, but also a microcosm of the Service itself. In this sense, the station occupied a very different position to the garrison, shore establishment, or dockyard. This was reflected, if nothing else, in the status and authority of the station commander enshrined in King's Regulations and the Air Force Act. While squadrons were the fighting arm, the majority of RAF personnel served on the strength of a station, undertaking the wide range of support activities needed to keep aircraft flying.

To shed some light on the differences between the Services it is interesting to note that in both 1918 and 1945, the RAF possessed more airfields and support units in the UK than frontline squadrons (see Figure 8). The same could certainly not be said about the number of ports versus warships or the number of garrisons versus regiments.

The Second World War

This massive investment in sustainability came into its own during the Battle of Britain. The disparity in approach to logistics issues between the respective air forces became clearer as the campaign progressed. Fighter Command maintained (if not enhanced) its frontline numbers during the battle, while the

The closest parallel to Trenchard's *incessant offensive*, the combined bomber offensive was founded on a massive industrial effort and a world-wide training programme that produced sufficient heavy bombers and crews to maintain operations in the face of desperate attrition. During the course of the war, Bomber Command lost over 74,000 aircrew (either killed, wounded, or prisoners of war) and 12,330 aircraft to operational and nonoperational causes²³ against a frontline strength that reached 4,384 aircraft by May 1945. During the course of 1944, 12,295 heavy bombers were delivered to Bomber Command—3,285 repaired, and the remainder new production—a wastage rate of 950 percent.^{24 25}

The manufacture, modification, and repair of aircraft had, by 1943, become Britain's largest industrial operation.²⁶ From 1939 to 1945 over 131,000 aircraft were produced, compared to 55,000 in the First World War. However, the complexity and weight were a magnitude greater, as was the cost. In 1943 alone, expenditure on new production by the Ministry of Aircraft Production (MAP) totalled some £800M (equivalent to £83B at today's prices).²⁷ Total wartime expenditure on aircraft and related equipment exceeded £3,75M (£385B) while the capital cost expended in creating the necessary industrial capacity amounted to £350M (£36B). Overall, more than 36 percent of wartime defence expenditure (around 20 percent of the UK GDP) was committed

RAF organisational structures and their associated processes continue to reflect the arrangements developed during the Second World War. Indeed, the emphasis on infrastructure, the heavy investment in equipment and the high ratio of support to combatant personnel have been defining characteristics of the Service for nearly 90 years.

Luftwaffe declined in strength as availability fell and aircraft and pilot wastage rose beyond the supply of replacements.

Notwithstanding heavy losses (fighter wastage reached over 50 percent per month during 1940), RAF reserves continued to grow throughout the war. The average number of aircraft in storage awaiting issue to the Metropolitan Air Force rose steadily, reaching over 10,000 by 1944, where it remained until the end of the war (see Figure 9).²¹

While some commentators have criticised the Allies for employing their significant economic and industrial capacity to support a military strategy built on brute force, the attritional nature of modern warfare and the pace of technological change allowed little choice in the matter.²² While it is true that the RAF and the United States Army Air Force relied on high production rates, an extensive supply system, and comprehensive support arrangements to compensate for high operational wastage, it is also true that these resources were available as a result of careful and detailed planning, driven by what the First World War had demonstrated about sustainability and airpower. Both air forces had long recognised that warfare in an industrial age demanded supply on an industrial scale.

to the RAF, of which some 40 to 50 percent comprised equipment costs.²⁸

At its peak (in the summer of 1944), more than 3 million personnel were employed in aviation-related activities, including 1.7 million in MAP and over 1 million in uniform (see Figure 10). This compares to a total employment of 630,000 in the First World War. In fact, the remorseless consumption of labour by the RAF and the MAP soon became unsustainable and had to be scaled back in favour of the Army and other critical war industries.

Nightly attacks by hundreds of heavy bombers against targets in Germany and Occupied Europe also demanded a sound and secure infrastructure. From 1939 to 1945, the airfield construction programme was Britain's largest civil engineering project since the building of the railways in the nineteenth century. A total of 444 new airfields were constructed in the UK at a cost of £200M (£20B) and employed over 300,000 men.²⁹ Approximately 1,800 airfields were constructed worldwide over the same period.³⁰ Each airfield consumed a vast range and quantity of resources, ranging from hardcore, concrete and bitumen for the runways, taxiways, dispersals and roads, to wood, bricks, and steel for the technical

accommodation and hangars. Stations—and there were 59 distinct designs dependant on functional role³¹—also required dedicated utilities and waste disposal, as well as extensive storage facilities and domestic accommodation. In 1942 over £145M (£16B) was spent on works for the RAF compared to just £4M in 1935, at the start of the expansion programme.³²

By the end of the war, the RAF frontline comprised some 500 squadrons and 9,250 aircraft.³³ The total inventory was in excess of 55,000 airframes with over 10,000 in store or in reserve in the UK alone, with a further 1,900 under or awaiting repair. New aircraft were being delivered at the rate of some 2,000 per month. As a result, the teeth to tail ratio was remarkably similar to that found nearly 25 years earlier—1 to 6 in 1945, and 1 to 8 in 1918 (see Figure 11).

Post-War Organisational Models

While the scale of the effort expended on the RAF during the Second World War was impressive, every brick laid and ton of concrete poured, anchored the Service's future to its infrastructure. Demobilisation and substantial reductions in manpower and estate did not alter the emphasis on the station as the RAF's centre of gravity. The Cold War, and the decreasing importance of expeditionary operations, enshrined this perspective, assisted by further infrastructure investment to accommodate heavier and faster aircraft as well as new roles, such as nuclear deterrence.

The early post-war years also saw a succession of studies and trials designed to determine optimum working patterns and organisational structures. This work had commenced during the war with research into improving manpower utilisation and aircraft availability through *planned flying* and *planned servicing*.³⁴ The focus was very much about treating operational output as a mechanistic process that could be improved using work study methodologies.

A similar effort was expended on determining best practice in the deployment of station manpower and appropriate station structures. An experimental station organisation was tested at RAF Tuddenham in 1946.³⁵ One of the aims was to relieve the station commander of a mass of administrative work. It was also hoped to weld station personnel into a single unit and thereby foster a good station loyalty and morale. A related study at RAF Binbrook also took place in 1946. It is perhaps the more famous of the two trials. From this latter study emerged the *standard* three-wing station structure (executive, technical, and flying) that has been the foundation of RAF station structures to this day.³⁶ The subsequent *Benson Experiment*, conducted in 1956, sought to address a number of detailed process and procedural issues largely related to personnel conditions and group cohesion.³⁷

The effort put into these studies and related work on squadron structures and alternative models for the management of maintenance (centralised, autonomous and semi-autonomous), was tacit recognition that the station was central to how the RAF went about its business. They might also be seen as *legitimising* the role of sustainability in determining the organisation and management of the Service.

While the Cold War reigned, and with expeditionary warfare a remote prospect, there was little incentive to change structures and certainly no challenge to the station's primacy in the organisational hierarchy. Command of a station remained the

aspiration of every ambitious officer and was widely seen as a critical test of an individual's ability and career potential. The station also loomed large in RAF culture, providing the social and domestic focus for the wider Service community. It is hardly surprising, therefore, that attempts to modify the basic station structure or to develop innovative administrative and operational arrangements, such as the Bentwaters/Woodbridge *Twin-Base Concept* in 1991, made little headway.

Expeditionary Warfare

RAF organisational structures and their associated processes continue to reflect the arrangements developed during the Second World War. Indeed, the emphasis on infrastructure, the heavy investment in equipment and the high ratio of support to combatant personnel have been defining characteristics of the Service for nearly 90 years.

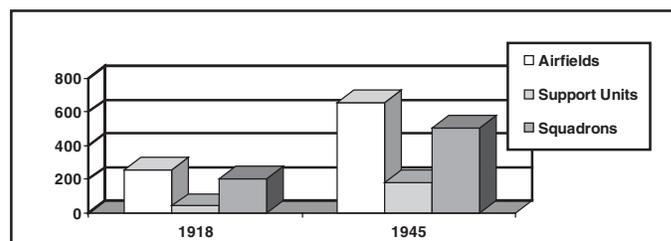


Figure 8. UK Airfields and Support Units

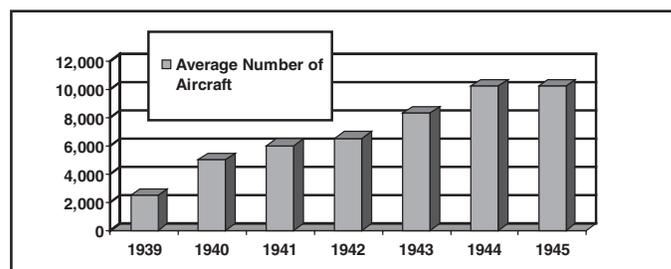


Figure 9. Aircraft In Storage 1939-1945

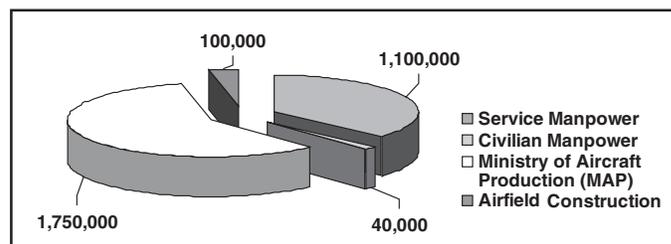


Figure 10. British Aviation Manpower July 1944

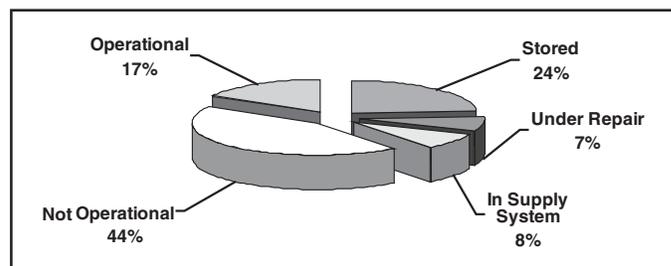


Figure 11. RAF Aircraft Dispositions May 1945

Expeditionary warfare and network enabled capability may be about to shift this particular paradigm. The *End-to-End Logistic Study*,³⁸ now known as the Logistic Transformation Programme (LTP), and continuing work on station structures offer the prospect of a significant change in the way the RAF is organised. Expenditure on aviation logistic support and on the procurement of aviation and aviation-related equipment continues to represent a significant proportion of the defence budget. History teaches us that this is not an unprecedented position, but, while it may prove challenging to reduce substantially the cost of sustaining airpower, the way the frontline is supported will certainly alter in the next few years.

We will see fewer uniformed support staff with some functions no longer carried out at station level—and many no longer under the control of the station commander. The four lines of maintenance and repair that have held good for over 50 years will disappear. The effect will be to dilute the status of the station in the overall organisation with a greater emphasis on force elements as the RAF's centre of gravity. We may therefore need to *unpick* the Binbrook model. The difficulty will be to sustain Service ethos while creating a more agile and adaptable organisation. The basic building block in the new construct may well be the squadron, if not the flight, rather than the station.

There is no doubt that the *brute force* approach to logistics is no longer viable. This approach is unaffordable, and does not

at least 30 years. We also have a vast inventory, support processes and policies tied to legacy weapons systems. Much as we might wish to move from supporting platforms to supporting military effect, there is a limit to what can be done with our older assets.

Although I have stressed the distinguishing characteristics of aviation logistics, as compared to defence logistics in general, these differences are likely to diminish with time as all military equipment becomes more complex and support systems more sophisticated and interdependent.⁴⁰

As warfare moves from the industrial age to the information age, we will inevitably see a change in the nature of logistics. Success will be measured by the adaptability of the support organisation rather than by its scale or scope. If nothing else, this threatens to transform the relationship between airpower and sustainability that has held sway for nearly 90 years.

But, however much we succeed in transforming our logistics processes, there will continue to be a tension between efficiency and effectiveness. A just-in-time philosophy built around a responsive and agile supply pipeline, a minimum deployment footprint, and extensive host nation support, may not always provide the resilience needed to sustain military capability.

A final word of warning, we must avoid the temptation of believing our predecessors to have been somehow less imaginative or more hidebound than we like to think we are. The logistics systems deployed by the RAF in both World Wars, and

We must avoid the temptation of believing our predecessors to have been somehow less imaginative or more hidebound than we like to think we are. The logistic systems deployed by the RAF in both World Wars, and throughout the Cold War, were more than effective—they were winning solutions. We should build on these successes while seeking better ways to meet today's needs. To my mind, caution and a degree of humility are called for rather than a relentless dash for the new and untested. Paradigms are rarely shifted overnight.

provide the flexibility and responsiveness that network-centric warfare demands. The logistics problems faced in Iraq were less about quantity and quality, and more about availability. The continuing concern about the inability to track individual items, and the debate about *precision-guided* logistics, presage fundamental changes in the way that supply chains and logistics will be managed in the future.³⁹

It is likely that we will gradually see a transition from a supply chain, built around a hierarchy of organisations, to a distributed network that can respond rapidly to changes in demand. The LTP echoes this approach although it does not (yet) offer the self-synchronisation needed to provide a *sense and respond* network.

We need to be cautious about what can be quickly achieved. After all, the RAF has toyed with serial number item tracking for

throughout the Cold War, were more than effective—they were winning solutions. We should build on these successes while seeking better ways to meet today's needs. To my mind, caution and a degree of humility are called for rather than a relentless dash for the new and untested. Paradigms are rarely *shifted* overnight.

Notes

1. Sir Frederick Sykes, *From Many Angles*, London: Harrap & Co., 1942, 97.
2. NATO AAP-6, *NATO Glossary of Terms and Definitions*, 2006, 158.
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28. Terraine, 602.
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Air Vice-Marshal Peter Dye, RAF, is currently the Head of Royal Air Force Transformation. He is stationed at Royal Air Force Innsworth, Gloucester, England.



The Themes of US Military Logistics

From a historical perspective, ten major themes stand out in modern US military logistics.

- The tendency to neglect logistics in peacetime and expand hastily to respond to military situations or conflict.
- The increasing importance of logistics in terms of strategy and tactics. Since the turn of the century, logistical considerations increasingly have dominated both the formulation and execution of strategy and tactics.
- The growth in both complexity and scale of logistics in the 20th century. Rapid advances in technology and the speed and lethality associated with modern warfare have increased both the complexity and scale of logistics support.
- The need for cooperative logistics to support allied or coalition warfare. Virtually every war involving US forces since World War I has involved providing or, in some cases, receiving logistics support from allies or coalition partners. In peacetime, there has been an increasing reliance on host-nation support and burden sharing.
- Increasing specialization in logistics. The demands of modern warfare have increased the level of specialization among support forces.
- The growing tooth-to-tail ratio and logistics footprint issues associated with modern warfare. Modern, complex, mechanized, and technologically sophisticated military forces, capable of operating in every conceivable worldwide environment, require that a significant portion, if not the majority of it, be dedicated to providing logistics support to a relatively small operational component. At odds with this is the need to reduce the logistics footprint in order to achieve the rapid project of military power.
- The increasing number of civilians needed to provide adequate logistics support to military forces. Two subthemes dominate this area: first, unlike the first half of the 20th century, less reliance on the use of uniformed military logistics personnel and, second, the increasing importance of civilians in senior management positions.
- The centralization of logistics planning functions and a parallel effort to increase efficiency by organizing along functional rather than commodity lines.
- The application of civilian business processes and just-in-time delivery principles, coupled with the elimination of large stocks of spares.
- Competitive sourcing and privatization initiatives that replace traditional military logistics support with support from the private business sector.

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contemporary issues

Logistics for the 21st Century: Deployment Distribution Operations Center,
Quick Fix or Long-Term Solution?

Operational-Level Analysis: DoD's Strategic Mobility and Logistics Support to the
Homeland Security Architecture

Contemporary Issues presents two analytical articles in this edition—"Logistics for the 21st Century: Deployment Distribution Operations Center, Quick Fix or Long-Term Solution" and "Operational-Level Analysis: DoD's Strategic Mobility and Logistics Support to the Homeland Security Architecture."

In the first article, the authors examine the question of whether the implementation of the Deployment Distribution Operations Center into US Central Command's theater of operations substantially changed the Joint logistical process, or was it simply the application of logistical expertise focused on key problem areas. The research finds the latter to be more likely. It is to some degree a fundamental change as to how the deployment and distribution system is focused on warfighter priorities. It is, however, more the application of strategic logisticians brought together to form a physical enterprise resource planning to bring a common operating picture to the entire distribution community.

In the second article the authors provide a comprehensive analysis of Department of Defense (DoD) logistics support to the Department of Homeland Security. The research includes analysis of the homeland security architecture and the national legal framework that govern the Department of Homeland Security and the DoD during homeland security operations and the challenges inherent in this relationship. The article includes a practical analysis of the logistics efforts during hurricane Katrina and the 2004 Indian Ocean Tsunami relief efforts. The authors conclude that there is a demarcation of two concentric logistics mobility missions at the tactical and operational levels; and mobility management for the latter should fall under the purview of US Transportation Command because of its inherent logistics organizational management design. The article ends with recommendations to develop a more formalized and structured architecture for coordinating all federal, state, and private airlift and mobility requirements for relief support and to enhance DoD's critical role in the homeland security.



Logistics for the 21st Century Deployment Distribution Operations Center, Quick Fix or Long-Term Solution?

Lieutenant Colonel Patrick Mordente, USAF
Paul Needham, PhD
Colonel Theodore P. Ogren, USAF

Our logistics professionals' achievements in OIF [Operation Iraqi Freedom] were especially spectacular in light of the fact that we supported a 21st century battlefield with a mid-20th century logistics structure.

—Lt Gen C.V. Christianson, *Baghrum, February 2002*

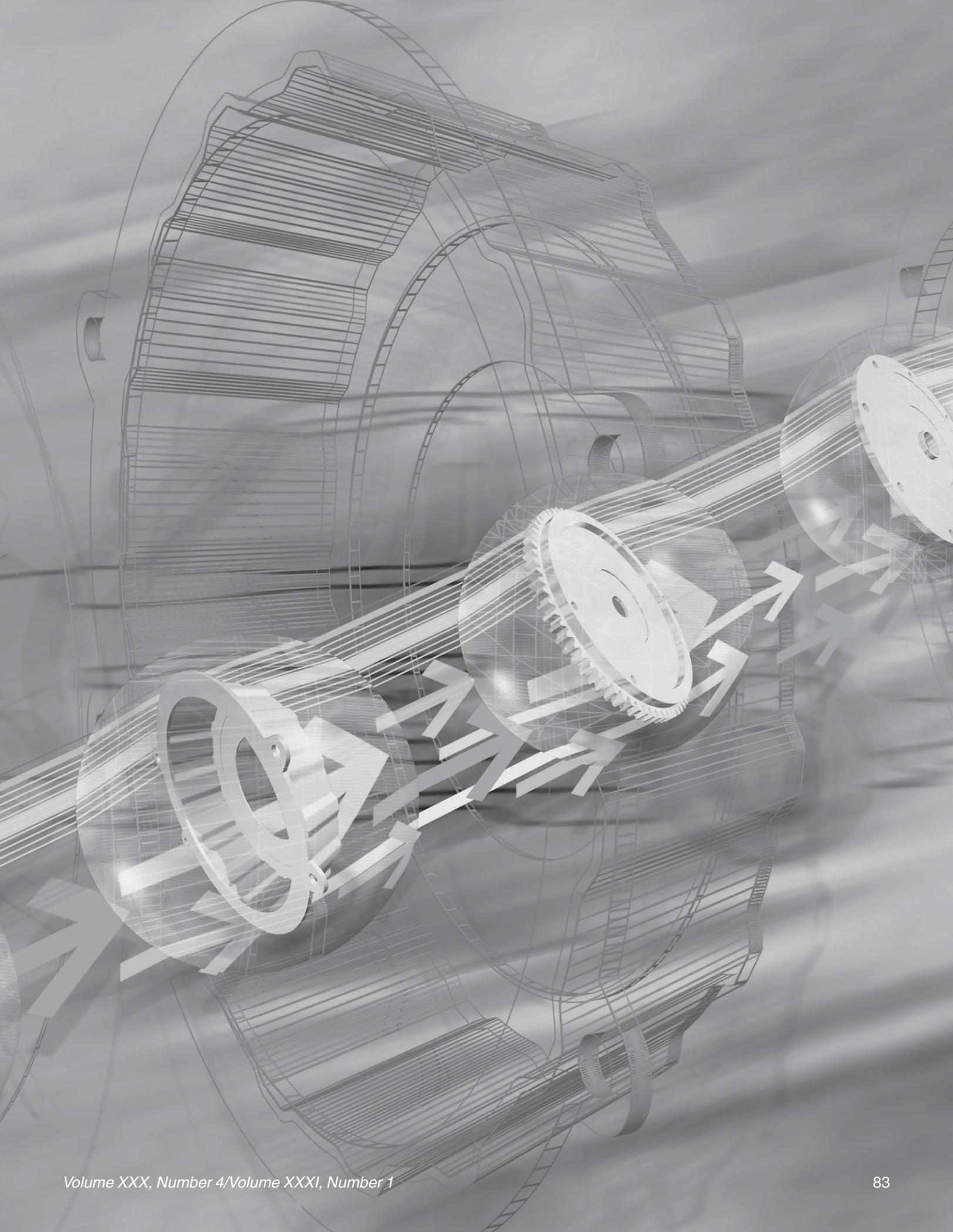
February 11, 2002 was a cold night in Baghrum, Afghanistan as Lieutenant Colonel Ken Rozelsky recalls.¹ He had just stepped off an Air Force C-130 cargo plane with his eight-man advance team from the 682nd Air Support Operations Squadron (ASOS), which he commanded. Lieutenant Colonel Rozelsky's squadron, a combat communications support unit, had been requested by the 10th Mountain Division and 3rd Army in support of the Joint Task Force (JTF) Headquarters for Operation Enduring Freedom. His flight into Baghrum was the end of a 7 hour flight and the last leg of a long journey which had started several days earlier at Shaw Air Force Base, South Carolina. For most, this would mark the end of a journey and the start of combat operations, but for Lieutenant Colonel Rozelsky it was just the beginning of many challenges with the Joint military logistics system.

Colonel Rozelsky's first obstacle was trying to get approval for his advance team to begin movement towards the Afghanistan theater. The United States Army had requested his unit be deployed into theater due to its unique communications capability and a valid requirement to support the JTF Headquarters. However, as the request for forces (RFF) made its way through the approval system, it was repeatedly denied at the Air Staff level. With little time left to meet the required delivery date, Colonel Rozelsky was ordered to use unit funds and move into theater by any means

possible. Ironically, the first leg of the journey to Afghanistan for the 682nd ASOS was supported by the German airline company Lufthansa. Once on the ground in Kuwait, Colonel Rozelsky was able to schedule further movement into Baghrum on an Air Force C-130. Three weeks later the RFF was approved.

Colonel Rozelsky began setting up operations as the rest of his team filtered into theater. With little infrastructure and no established supply lines or procedures, Colonel Rozelsky was forced to become self sufficient. He quickly created his own supply line, consisting of a team of airmen positioned in Kuwait, to purchase much needed operating supplies for the squadron. His supply team consisted of five Airmen—one with an Impact card to make the purchase and four to package, ship, and guard the supplies enroute to Baghrum.

Lieutenant Colonel Rozelsky's story highlights a military logistics system that was unable to respond rapidly to unit movement and sustainment requirements. Ultimately, it left Colonel Rozelsky, a supply chain customer and combat squadron commander, thinking that there had to be a better way of doing business.



Introduction

Who lin'd himself with hope, Eating the air on promise of supply.

—William Shakespeare's King Henry IV Part I²

Since the dawn of warfare, the ability to execute a successful campaign has rested squarely on the foundation of military logistics. It is from a well established logistical foundation, one capable of rapid response, flexibility, and ability to meet demand, that combatant commanders have the capacity to execute freedom of maneuver and strike at the enemy with continuous force. It is in the role of meeting the warfighter's logistical requirements that one begins to realize that tacticians are responsible for fighting the battle; but it is the logistician that ensures the battle can be fought. An appreciation for the importance and complexity of the relationship between warfighter and logistician is reflected in the remarks by United States Transportation Command (USTRANSCOM) commander, General John Handy, "Good warfighters always want to know where their logistic experts are well before the battle starts and during the battle."³ However, the US military's most recent combat and peacekeeping operations in Afghanistan and Iraq have highlighted the need for improvement in the effectiveness and efficiency of the strategic distribution process. Improvements to the strategic distribution process will require a systematic approach that tackles issues from the supply point of origin to

the final destination point in-theater, and the retrograde of both parts and equipment back to the US mainland. The deployment distribution operations center (DDOC), a Joint logistics initiative by the distribution process owner USTRANSCOM, is a relatively new initiative aimed at improving Joint logistics for the combatant commander.

This article investigates the impact of United States Central Command's (USCENTCOM) DDOC on the military's deployment and distribution system. First, the study will focus the discussion by defining both the players and the processes supporting today's supply chain management as it relates to both deployment and distribution. Second, it will propose a strategic road map for the 21st century Joint logistics system in the form of a balanced scorecard. Third, it will examine the development of the current DDOC concept by defining the DDOC's current mission and organizational structure and how the DDOC concept fits into the balanced scorecard. Finally, by studying key metrics provided by the DDOC's after-action reviews (AAR) and the Logistical Support Agency (LOGSA), it will determine what improvements, if any, were made to the Joint logistics system. Ultimately, this article will answer the question as to whether the implementation of the DDOC into USCENTCOM's theater substantially changed the Joint logistical process or whether the application of logistical expertise simply focused on key problem areas.

Defining Today's Supply Chain and its Members

When broaching the subject of supply chain management processes within an organization such as the Department of Defense (DoD), one begins to address a broad range of processes and practices that define many different aspects within the military. A basic definition of supply chain management taken from the Global Supply Chain Forum defines the term supply chain management as, "...the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders."⁴ As such, the supply chain management processes of today's modern military encompasses an array of organizations within the DoD and affect business practices involving the acquisition, delivery, deployment, sustainment, and final disposition of personnel and equipment in both peacetime and combat.

When evaluating the impact of the DDOC in USCENTCOM's area of responsibility (AOR), we are primarily concerned with that portion of the supply chain that deals with the movement of personnel, equipment, and sustainment from stateside locations to final destination on the battlefield. Therefore, we are concerned with that portion of the supply chain that affects the processes in movement of personnel, equipment, and sustainment from *factory to foxhole* during combat operations. Figure 1 provides a graphical representation.

Figure 1 describes a supply chain environment that moves personnel, equipment, and sustainment through a transportation pipeline, while being supported by a data environment, in order to affect the timely and accurate delivery of requirements to a forward location or tactical assembly area (TAA) for a combatant commander's use in Joint combat operations. The ultimate goal of this process is *the right part at the right place at the right*

Acronyms

AAR - After Action Reviews
ASOS - Air Support Operations Squadron
AOR - Area of Responsibility
CDDOC - CENTCOM Deployment Distribution Operations Center
CFLCC - Coalition Forces Land Component Command
CJTF - Combined Joint Task Force
COP - Common Operating Picture
DLA - Defense Logistics Agency
DoD - Department of Defense
DDOC - Deployment Distribution Operations Center
ERP - Enterprise Resource Planning
GAO - Government Accountability Office
ISB - Intermediate Staging Base
ITV - In-transit Visibility
JDDOC - Joint DDOC
JMC - Joint Movement Center
JOPES - Joint Operational Planning and Execution System
JTF - Joint Task Force
LOGSA - Logistical Support Agency
OIF - Operation Iraqi Freedom
RFF - Request for Forces
RSOI - Requisition and Delivery of Personnel, Equipment and Supplies
RWT - Requisition Wait Time
TAA - Tactical Assembly Area
TAV - Total Asset Visibility
TPFDD - Time-Phased Force Deployment Data
USCENTCOM - United States Central Command
USTRANSCOM - United States Transportation Command

time. This figure, simple in its design, is complex in its scope. It involves both a strategic movement from the CONUS to some type of port facility or intermediate staging base (ISB) and the follow-on integration, tactical movement, into the forward battle area. It also encompasses the multitude of Joint- and Services-specific information systems and processes that are required to accomplish the requisition and delivery of personnel, equipment, and sustainment (RSOI).

The strategic movement piece involves a triad of transportation assets ranging from airlift to both sealift and prepositioned supply ships. This strategic piece is often referred to as the *strategic mobility triad* and falls under the control of USTRANSCOM with its three subcomponents of Air Mobility Command, Military Sealift Command, and the Surface Deployment and Distribution Command. The onward movement and integration within a theater of operations is accomplished through the use of tactical transportation assets including airlift, ground transportation, and waterway movement. This tactical piece represents a tactical mobility triad that exists within a theater of operation and falls under the responsibility of the combatant commander. In the case of Iraqi Freedom and Enduring Freedom, the tactical mobility triad is the responsibility of United States Central Command (USCENTCOM). However, unlike the strategic mobility triad assets that are controlled and synchronized by a single headquarters, USTRANSCOM, the authority to direct assets that support the tactical mobility triad is dispersed among functional entities at the Joint Task Force (JTF) staff level (Air Mobility Division) and echelons above Corps, as is the case with Army transportation assets. To further illustrate this point, the following quote was taken from the USCENTCOM Deployment Distribution Operations Center (CDDOC) After-Action Report, Spiral 1, dated May of 2004.

In order to provide the synchronization of the theater for inbound and outbound cargo and passengers, CDDOC needed to have a directive authority. In its position with Coalition Forces Land Component Command (CFLCC), CDDOC did not own any transportation resources and did not exercise the directive authority that it was supposed to have. Directive authority over the transportation assets rested with the CFLCC C-4 and the 143rd TRANSCOM.

Recommendation: In order to have true synchronization you need to have a capability that ties the forecasted strategic flow of cargo and passengers to tactical movement. If CDDOC is supposed to represent that capability, it must have the authority to direct lift assets to accomplish this effort within the priority scheme developed by USCENTCOM J-4.⁵

This aspect of tactical level command and control has been highlighted, not to suggest that all military transportation assets should be placed under one commander; but rather, to emphasize the self-imposed complexities of the tactical mobility triad. These very same complexities were overcome in the combat air forces through the use of a

Joint forces air component commander responsible for the direction, integration, and synchronization of military airborne assets through the use of an air tasking order process that provided unity of effort and domain-wide visibility for airborne assets operating within a given AOR.⁶

The complexities of the intratheater transportation system are equally matched by the multitude of processes and players involved from the tactical through strategic levels of deployment and distribution. From the start of an operation or contingency when supported and supporting relationships are defined between unified commands, until final redeployment of all military forces, an intricate series of actions is performed within the DoD to enable a combatant commander to effectively execute combat operations. The interactions that take place involve USTRANSCOM and other unified commands in the role of a supporting command, along with the Defense Logistics Agency (DLA), USCENTCOM's Joint task force, and the Services' unique sustainment systems. The processes that define deployment and distribution require all these players to form partnerships and accurately communicate information between the Joint staff, unified commanders, the Joint task force, DoD support agencies, and Service headquarters and their deployed units (to include the Reserve component). See Figure 2, Deployment and Distribution Process and Players

However, the process has been further complicated by the fact that many of the logistical business practices found within the Services are unique and stovepiped. In addition, the information management systems that support the overall process are numerous and not necessarily compatible with each other. What is obvious by this point is that data and information management and integration continue to be major challenges to deployment and distribution operations. A process change that enhances the flow of information would have a positive impact on the current system and would produce a measurable improvement in both the deployment and distribution processes.

With the transportation flow and players defined, the example of Lieutenant Colonel Rozelsky's effort to deploy the 682nd ASOS to Afghanistan and then to sustain his unit in theater stress the challenges within the deployment and distribution system.

In the case of the 682nd ASOS movement, had the deployment and distribution system worked efficiently and effectively, the supported commander (USCENTCOM), would have identified and communicated a capability requirement via the Joint Operational Planning and Execution System (JOPES), a data information management system and process. Then, in concert with the Joint staff, supporting commands and Service components, the 682nd ASOS would have been identified and

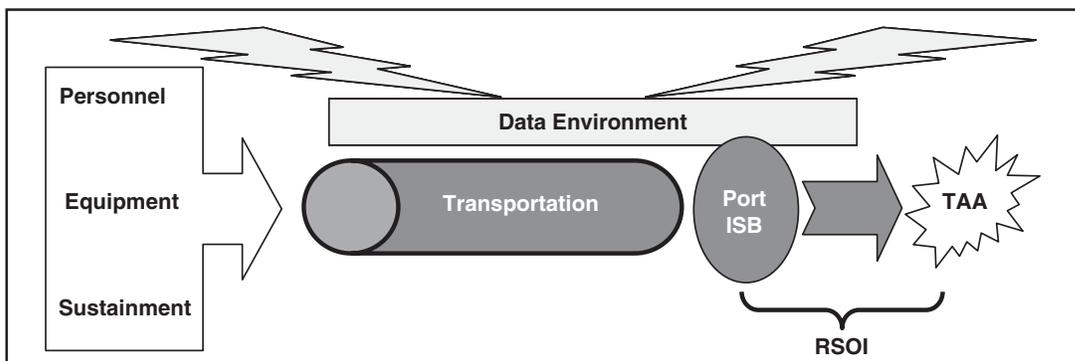


Figure 1. Idealized Supply Chain—Factory to Foxhole

designated for deployment. Once validated by the supported commander (USCENTCOM), the 682nd ASOS would be entered into the time-phased force deployment data (TPFDD) and scheduled for movement into theater. Current JOPES directives require that the 682nd ASOS movement be scheduled from a point of embarkation to final destination eliminating Lieutenant Colonel Rozelsky's extended wait time for onward movement and integration into Baghram, Afghanistan. Once in position, the 682nd ASOS should have been able to tap into Service-specific supply processes to meet unit sustainment requirements.

The 682nd ASOS story is just one of many and is anecdotal in nature; however, it does serve to underscore a failure in the Joint deployment and distribution process. Nonetheless, once shortcomings in a current process have been identified, but prior to initiating improvement, an organization must define the vision of what the process should be capable of performing; and ultimately, what the process should look like following improvement efforts. It is relatively easy to identify failure points in a process; it is far more difficult to define a vision that captures what the process should look like and be able to deliver. More importantly, the vision must fully integrate and shape both the processes and players into a future logistics system that meets the needs of a 21st century battlefield.

The Future Joint Logistics System: A Balanced Scorecard⁷

When looking at today's Joint deployment and distribution process, there are ten defining gaps impacting capability.⁸ First, a modern battlefield consists of operations that are widely dispersed and no longer linear in design.⁹ This can become challenging when trying to sustain units spread over a wide area. Second, a nonlinear battlefield, such as Iraq, also has a significant impact on the security of main supply routes (MSRs) and requires the logistician to devote resources to protect assets.¹⁰ Third, the US military is becoming more reliant on contractor support due to a reduction in military personnel.¹¹ The contractor's support

is becoming intertwined with military operations, such that it is driving their presence on a nonlinear battlefield. Fourth, the US military is no longer facing the conventional warrior.¹² America's new enemy is highly adaptive and uses unconventional methods to strike at US forces. Fifth, current operations, and those for the foreseeable future, will require the US military to be Joint and work with (or integrate) with interagency and coalition forces.¹³ Sixth, the days of financing combat operations through supplementals are more than likely numbered.¹⁴ Therefore, budget pressures will continue to drive the DoD to work smarter and cheaper. Seventh, Title 10 responsibilities of the Services versus the roles given to the combatant commands (COCOMs) are at times, in direct contradiction of each other.¹⁵ The eighth gap concerns Joint logistics functions where agencies, within the DoD, have been assigned as an executive agent for a given logistics requirement.¹⁶ Currently, these functions have difficulty performing optimally due in part to a lack of training between affected Services. This lack of training results in the absence of a habitual relationship, and a task organization that is ad hoc in nature and done on the fly. Ninth, the current distribution process is inadequate.¹⁷ The warfighter requirements are difficult to see, in-transit visibility (ITV) is limited, and the current system is not flexible in its response to rapidly moving units. The tenth and final capabilities gap is connectivity.¹⁸ Once units move into contact with enemy forces, they lose connectivity and requirements determination becomes difficult. At one point during Operation Iraqi Freedom, rear area support did not receive requisitions for an entire month, forcing a push system to be put into place. With the gaps in the current process now defined, the next step of defining the future logistics system can be accomplished.

First and foremost, a logistics system designed to meet the requirements for the 21st century battlefield must be customer-focused. The customer for a Joint logistics system is the warfighter, consisting of the combat commander and every sailor, soldier, airman, and marine located on the battlefield. When developing a strategic vision for 21st century logistics, the theme of a warfighter-focused process must be evident throughout its entire development. With that said, a good vision starts with a good foundation.

A warfighter-focused logistics system must set itself on the foundation of a learning and growth perspective¹⁹ which includes the "priorities to create a climate that supports organizational change, innovation, and growth."²⁰ The four areas within this foundational perspective are organizational structure, technological improvement, professional development, and organizational policy. These four areas are interdependent and begin shaping the organization. The learning and growth perspective leads directly to the next level of an internal perspective.

As the 21st century Joint logistics system begins building upon the foundation of a learning and growth perspective, it must take an internal perspective²¹ in order to set "strategic priorities for various business processes, which create customer ... satisfaction."²² This perspective can be developed under two categories, achieving operational excellence and strategic relationships.²³ In order to achieve operational excellence, the deployment and distribution system must be capable of delivering "unity of effort, domain-wide visibility, and rapid and precise response."²⁴ Under the category of strategic relationships,

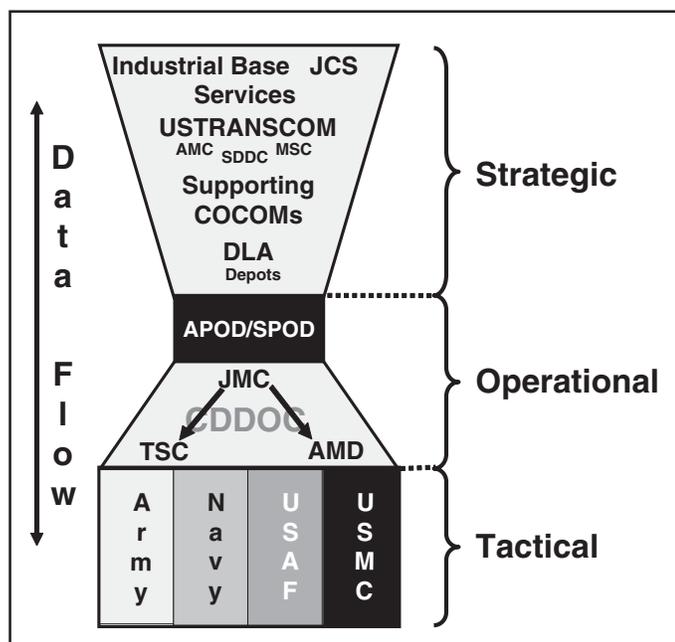


Figure 2. Deployment and Distribution Process and Players

the future system must be capable of forming a seamless process from *fort to foxhole* and build trust among the various organizations that comprise the deployment and distribution system. Both of these categories are overlaid with a necessity to accurately forecast end-user requirements, which will enhance operational excellence while building strategic relationships. The objectives of an internal perspective are enablers to the objectives from both a financial perspective²⁵ and customer (warfighter) perspective.²⁶ A financial perspective is defined as, “[t]he strategy for growth, profitability, and risk viewed from the perspective of the shareholder.”²⁷ In this case, an argument can be made that the shareholder is not only the DoD, but the American taxpayer. The customer perspective is used to develop, “[t]he strategy for creating value and differentiation from the perspective of the customer.”²⁸ In the case of the DoD, where the majority of logistics is internal to the organization, the emphasis should be on creating value for the warfighter.

From a financial perspective, unity of effort coupled with both domain-wide visibility and accurate forecasting of end-user requirements will lead to the optimization of limited transportation assets. An efficient and effective use of limited transportation assets will lead to total cost (cost, resources, and money) savings for the Joint force.

Transitioning to the customer (warfighter) perspective, the overarching subcategories of achieving operational excellence and strategic relationships contribute directly to the customer’s perception of the value created by a Joint logistics system. The Joint warfighter requires a logistics system that can provide availability, flexibility, timeliness and consistency. These four characteristics of a logistics system allow unhindered operations and freedom of movement and directly feed the stakeholder’s perspective,²⁹ the final destination of a Joint logistics system designed for the 21st century.

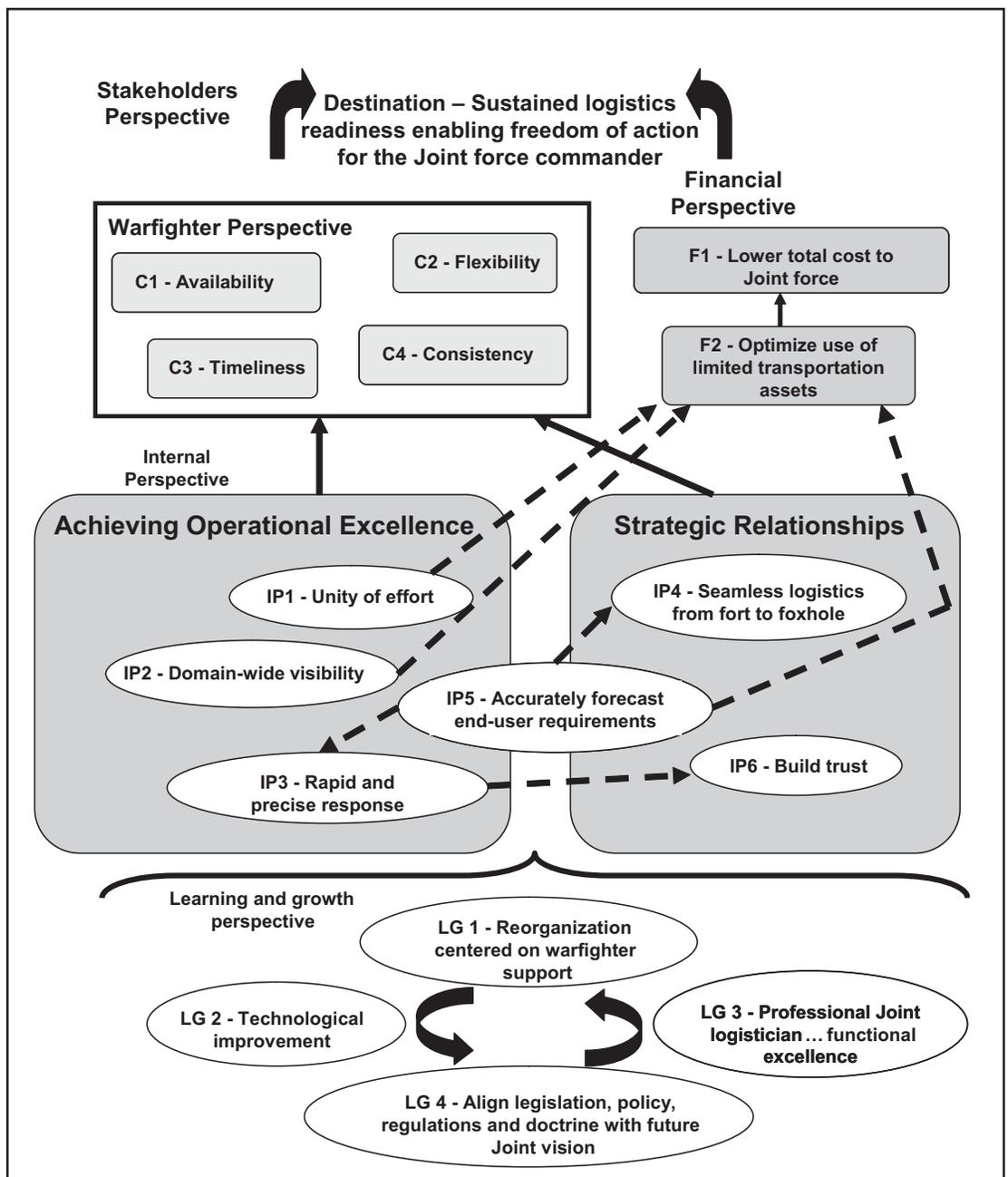


Figure 3. 21st Century Joint Logistics Balanced Scorecard

From an overall stakeholder’s perspective and vision for the future of military logistics, the deployment and distribution system must be capable of delivering, “sustained logistics readiness enabling freedom of action for the Joint force commander.”³⁰ The concepts presented in Kaplan and Norton’s book, *The Strategy-Focused Organization*, coupled with the above discussion, lead to a stakeholder’s (constituent) scorecard.³¹ See Figure 3³² for the development and management of a 21st century deployment and distribution system.

How Does the DDOC Fit In?

DDOC Mission

As stated in the USCENCOM AAR dated May 2004, the USCENCOM DDOC mission was to,

Confirm USCENCOM deployment and distribution priorities, validate and direct CFACC intratheater airlift requirement support

to components and CJTFs, monitor and direct CFLCC intratheater surface distribution support to components and CJTFs, adjudicate identified USCENTCOM distribution and intratheater shortfalls, coordinate for additional USTRANSCOM support, provide total asset visibility (TAV) and in-transit visibility (ITV) for intertheater and intratheater forces and material, and set the conditions for effective theater retrograde.³³

Figure 2 graphically illustrates where the CDDOC fits into the overall process. The CDDOC was an effort to fill the gaps within the deployment and distribution system between the strategic, operational and tactical levels. In essence, the DDOC formed a physical enterprise resource planning (ERP) environment, vice a virtual environment, that was capable of gathering data from various information systems to enhance the overall common operating picture (COP). The requirement for a physical ERP is necessary due to the vast number of information systems required to formulate a logistics-oriented COP. In addition, the *physical* aspect of the ERP is driven by the fact that much of the data does not exist in systems that are compatible with each other; and therefore, Service and Joint skilled logisticians are required to correlate information feeds.

Future development of the JDDOC (Joint DDOC) concept will take place in each of the geographically aligned unified commands along the same conceptual design as the original CDDOC. Its purpose is:

A Joint capability solution designed to satisfy the requirements to integrate strategic and theater deployment execution and distribution operations within each of geographic combatant commander's area of responsibility. The JDDOC, under the control, direction and auspices of the geographic combatant commander, directs, coordinates and synchronizes assigned forces' deployment and redeployment execution, and distribution operations ... to enhance the combatant commander's ability to execute logistics plans with national partner support.³⁴

The DDOC initiative can be used to demonstrate how a concept can be evaluated against the newly developed balanced scorecard for Joint logistics. The DDOC was a doctrinal change (LG 4) to the theater logistical process in the form of a newly developed organization centered on warfighter support (LG 1). It leveraged existing technology (LG 2) and formed a team of professional Joint logisticians (LG 3), with the intent to enhance unity of effort (IP 1) and improve both domain-wide visibility (IP 2) and rapid and precise response (IP 3) of the theater deployment and distribution system. Once established in-theater, the DDOC's objective was to provide accurate (C 1), timely (C 3), and consistent (C 4) logistics to the warfighter. With improved visibility, it was also intended for the DDOC to improve the use and optimization of limited transportation assets (F 2). Finally, the ultimate goal of the DDOC is to provide, sustained logistics readiness enabling freedom of action for the Joint force commander.

Why a DDOC?

Upon this point a page of history is worth a volume of logic.

—Oliver Wendell Holmes, Jr

As Oliver Wendell Holmes points out, history can teach us a lot. Operations Enduring Freedom and Iraqi Freedom are no exception. US forces had operated in that region in the early 1990's in Operations Desert Storm and Desert Shield. However,

a recent Government Accountability Office (GAO) Report reveals that we had not learned much from the not-too-distant past. The following are quotes from the GAO report dated August 2005.

Operation Desert Shield and Desert Storm-1991

The deployment of combat forces to the theater of operations in advance of support units created logistical support difficulties. The military's decision to *push* enormous amounts of equipment to the theater and to deploy combat units before support units in the first 3 months of the campaign contributed to the Army's and Marine Corps' problem of limited capability to store and retrieve equipment and supplies during the initial stages of Operation Desert Storm. A small cadre of logisticians was established to receive incoming equipment, supplies, and personnel; support the combat units that were deployed; and build a logistics infrastructure in an austere environment.³⁵

Operation Iraqi Freedom-2003

DOD's priority was for combat forces to move into theater first. A study suggested that distribution assets were either deleted from the deployment plan or shifted back in the deployment timeline. As a result, logistics personnel could not effectively support the increasing numbers of combat troops moving into theater. A shortage of support personnel in theater prior to and during the arrival of combat forces was reported, and those who arrived were often untrained or not skilled in the duties they were asked to perform. The shortage resulted in delays in the processing (receipt, sorting, and forwarding) of supplies, and backlogs. Contractors performing distribution functions had become overwhelmed and a Joint contractor military organization quickly evolved. As two divisions entered the theater, the need for a theater distribution center became apparent and an area in the desert was designated as a storage and cross-dock area.³⁶

The GAO report cited other similar challenges during Operations Desert Storm, Desert Shield, and Iraqi Freedom. These cited similarities were categorized under the headings of limited communications (as it related to supply), limited asset visibility, misuse of shipment prioritization, shortage of ground transportation assets, and in-theater distribution difficulties.³⁷

Retired Army Lieutenant General William Pagonis had witnessed the events of Desert Shield and Desert Storm first hand as General Schwarzkopf's head of logistics for the USCENTCOM theater.³⁸ In his book *Moving Mountains*, he wrote the following:

Why, in an era of decentralization, is integration the way to go? Because, as I see it, logistics is a field that is particularly prone to suboptimization. Our logistical mission in the Gulf was to protect and provide for our troops, and thereby aid in the liberation of Kuwait. In support of this mission, our stateside shippers made heroic efforts to stuff every Gulf-bound ship absolutely full, ...meanwhile, on the receiving end, our port operators were swamped... What was needed to resolve that conflict and avoid suboptimization was a *kingpin*—someone who could assess the imperative of each functional area and decide upon a solution that best supported the mission. In the Gulf, I was lucky enough to be selected to serve as that person. I would argue that every complex organization that is involved in materials management, handling, and distribution needs my equivalent.³⁹

General Pagonis recognized the need for one logistics voice, a kingpin, setting priorities for the warfighter. He also recognized the need for a kingpin due to the many links that make up a supply chain and can lead to its weakness and cause suboptimization in the overall distribution system. The DDOC could be that one voice that sets logistics priorities for the combatant commander.

The bottom line result of the initial stages of Operation Iraqi Freedom was a theater logistics infrastructure that was slow to mature, resulting in the delay of critical logistics functions (“processing, receipt, sorting, and forwarding) of supplies, and backlogs”⁴⁰) that then inhibited the support systems ability to provide optimal support to combat operations. As a result, USTRANSCOM, in its role as the Secretary of Defense-designated distribution process owner (DPO), in concert with USCENTCOM, DLA, and Army Materiel Command, developed the DDOC concept based upon the Joint movement center concept in order to improve the overall theater distribution system. This was an opportunity for USTRANSCOM, in concert with DLA, to move logistics professionals forward as part of the USCENTCOM organization to affect positive change to the overall deployment and distribution system.

Therefore, with an understanding of the challenges facing the deployment and distribution system, based on both historical precedence and current observations, it was time to put a DDOC type concept into action. On 18 January 2004, the USCENTCOM CDDOC began operations collocated with the JTF land component commander in Kuwait.⁴¹ A team of 63 professionals, primarily from USTRANSCOM and the Defense Logistics Agency (DLA) brought the tactical view to the strategic players in an effort to enhance overall deployment and distribution processes within USCENTCOM’s AOR.

The Single Ticket concept is the scheduling of transportation for military units from a stateside aerial port of embarkation all the way through to the foxhole in one single movement piece.

DDOC Objectives and Metrics

Metrics drive performance. That is because what is important to an organization is what that organization should be measuring. Therefore, when evaluating performance, the selection of metrics must be accurate, appropriate, and common to all users. That is not to say that all organizations choose the correct metrics to measure their performance. However, what is chosen to be measured, if it has not already shaped an organization or a process, soon will.

When the CDDOC arrived in theater in January of 2004, it came with four well defined objectives.⁴²

- Provide total asset visibility and in-transit visibility, sustainment, and retrograde (the process of recovering and returning military material and supplies to units, depots, or prepositioned stock)
- Refine theater distribution architecture in coordination with Joint staff and the Services
- Synchronize strategic and operational distribution
- Develop strategic and operational distribution performance measures

These four objectives drove key initiatives such as Single Ticket, Pure Pallet, and Purple/Green Sheeting. From these initiatives came measurements of success (metrics) such as customer wait time (CWT) on personnel during a unit’s

intermediate stop prior to final destination, TAV of personnel in transit, and requisition wait time (RWT) primarily on Class IX material. Following is a brief description of some of the initial programs implemented by the DDOC and the initial success experienced by those efforts.

The Single Ticket concept is the scheduling of transportation for military units from a stateside aerial port of embarkation (APOE) all the way through to the *foxhole* in one single movement piece.⁴³ The Single Ticket concept was not a new concept. The Joint Operation Planning and Execution System (JOPES) processes had directed that units be scheduled from point of origin to final destination. However, units moving into USCENTCOM’s theater prior to the establishment of the DDOC would be scheduled only to an aerial port of debarkation (APOD), where they would await further coordination on transportation for movement to their final destination. Single Ticket began *marrying up* the strategic movement from the states with the tactical movement within theater. Just some of the highlights of success are listed below.⁴⁴

- Unit loiter time was reduced from 72 to 30 hours.
- Over 130,000 passengers moved with an average ground time of 30 hours.
- As of December 2004, a Single Ticket Tracker was released providing units with 100 percent TAV of all booked passengers.

- During December 2004, the Single Ticket program moved Air Force AEF deployers. The result was 84.8 percent of the passengers moved in 24 hours or less.

The results prompted the Commandant of the United States Marine Corps to state, “Tell all of your supporting staff, including your USCENTCOM DDOC and AMD friends, that they are receiving the highest compliments from the Marine Corps!”⁴⁵ As the CDDOC tackled the issues associated with troop movement, they also began looking at cargo movement and palletization, which led them to the Pure Pallet concept.

The CDDOC, in concert with US Army personnel, developed the Pure Pallet initiative to eliminate time and material loss when shippers mixed multiple end-user requirements on a single pallet. The mixed pallets required additional movement time because of the requirement for breakdown and reconfiguration at an intermediate point before continuing on to the final destination.⁴⁶ In addition, during breakdown many individual items would lose addressing information and become distressed cargo. The following is an example of suboptimization as cited by General Pagonis.

Although the pallets moved quickly out of the DLA stateside depots, a DLA metric, the additional time required down range to reconfigure pallets, coupled with the lost material, suboptimized the overall distribution system.

Therefore, the DDOC saw a need to implement the Pure Pallet initiative. A pallet that is designated as a *Pure Pallet* has one end-user location requirement on a single pallet, thus facilitating movement to the final destination.⁴⁷ A pure pallet is built at the embarkation or depot points stateside.⁴⁸ These pure pallets are then shipped with little to no delay to their final destination.⁴⁹ For example, 98 percent of the pallets received at Ballad AB, Iraq, a high demand end-user location, are pure pallets.⁵⁰ As a result, throughput velocity was increased.⁵¹ However, the CDDOC realized that a lack of true prioritization in cargo movement was also impacting USCENTCOM's distribution system and as a result, began implementing the Green/Purple Sheet Priority System.

Prior to implementation of the Purple/Green Sheeting Priority System, the distribution process within USCENTCOM was susceptible to a prioritization abuse by end users. The overuse of high priority designation by end users caused confusion in the system and led to truly high priority cargo being impacted by the movement of lower priority requirements. The CDDOC developed a method so that the combatant commander and Services could distinguish regular cargo from that of a higher priority cargo requirement. It was simple in design yet very effective in application. It consisted of *green* sheets, controlled by the Services, and a *purple* sheet, controlled by the combatant commander.⁵² A movement requirement that was deemed a high priority by either the Services or combatant commander was designated using these sheets; and moved more quickly in response to a high priority need within theater.⁵³

Both the Pure Pallet and Purple/Green Sheeting were two initiatives that focused on increasing the throughput velocity in the distribution system. A study of the data supplied by LOGSA in Figure 4 reveals a steady decline in RWT 5 months after the January 2004 stand up of the CDDOC, with the biggest

third rotation in the Iraqi theater. The last two points do highlight the fact that, after 3 years, the Iraqi theater is no longer new. In other words, logistics maturation has taken place over time. Infrastructure has been built up and processes have been established. Therefore, one would expect a reduction in RWT over time due to an established operational theater.

Implications for Senior Leadership and Future Development

In reviewing RWT data, this research concludes that the extended time period to reduce RWT (a metric that focuses on warfighter support) from 23 days to 15 days, a process that took approximately 2 years, was due, in part, to a slow introduction of logistics assets into theater during the initial phases of conflict. Therefore, one would surmise the TPFDD flow should be adjusted to maintain proper logistics support during the early phases of operation and continue to build support in proper proportion to increased operational requirements. However, during this research it has been suggested that the findings of the GAO, which show a late introduction of logistics support elements into the AOR, reflect the realities of how unified commanders choose to phase forces in the TPFDD flow.⁵⁴ If the GAO report truly reflects a change in force flow execution, then it is incumbent upon the Joint and Service logistics and operational communities to redefine business processes and shape future development based on a limited logistics footprint during the initial phases of conflict. The development of the DDOC concept suggests an acknowledgement of this situation and signals a need to overcome shortfalls in the current Joint theater logistics system. In addition, the findings of the GAO report, coupled with a need to implement a DDOC concept, signal the obvious. It acknowledges the need for a fundamental change to logistics

The deployment of the DDOC into USCENTCOM's theater was a result of the shortcomings in the deployment and distribution system that came about due to a conscious delay in the deployment of logistical support into theater despite written doctrine to the contrary.

decline taking place between August and September of 2004. Also, RWT values begin to hold steady at close to the expected 14-day standard by February 2005. A cross comparison of the quantity of requisitions per month shows a cyclical ordering pattern leading this researcher to conclude that the reduction in RWT was as a result of improvements and maturation in the theater distribution system, vice a reduction in the volume of requisitions. However, to assume that the DDOC is solely responsible for the reduction in RWT would be incorrect. There are several factors that must be considered when trying to determine the cause of reduction in RWT. They include the establishment of a DLA warehousing facility in Kuwait, the establishment of a theater distribution center (TDC), the eventual arrival of logistical support units into theater in sufficient quantities, and the fact that many units are on their second or

support structures, from the tactical to strategic level, to better meet the requirements of a post-Cold War military operating under a force projection strategy vice a forward presence strategy. This research also concludes that the introduction of the DDOC concept into USCENTCOM's JTF staff had a positive impact on the theater distribution system; and given the realities of a limited logistics footprint during the initial phases of conflict, is a move in the right direction. The DDOC is an organization capable of voicing deployment and distribution priorities, and through the DDOC organizational structure, setting warfighter-focused logistics objectives, implementing programs, and focusing on problem areas within the deployment and distribution system for a combatant commander. In addition, it can align both strategic and operational players to meet the combatant commander's warfighting needs; however, based on the metrics

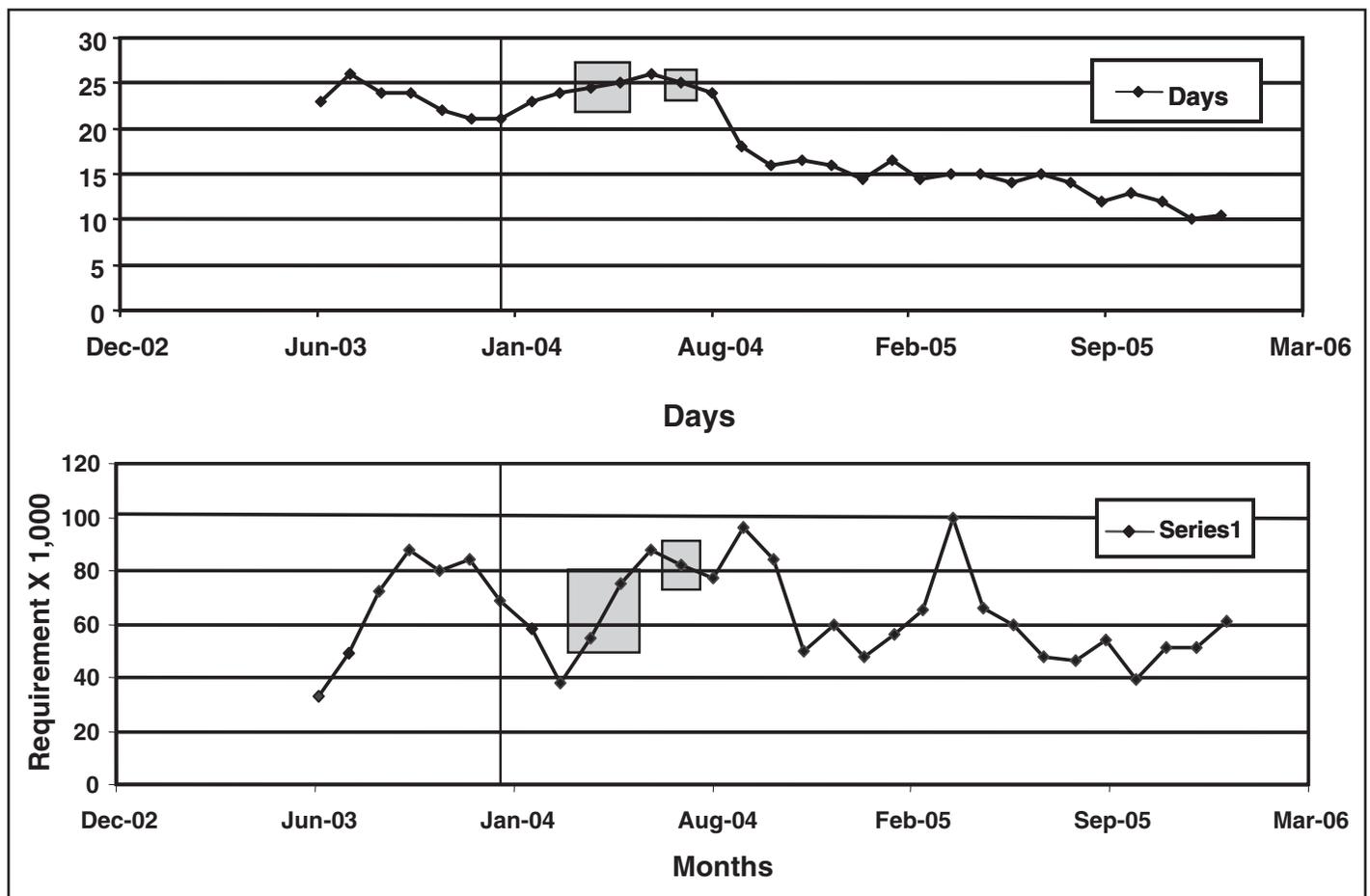


Figure 4. Top Chart: Requisition Wait Time Values for Iraq per Month June 2003 - January 2006; Bottom Chart: Total Number of Requisitions per Month June 2003 - January 2006; Black Line is DDOC Stand-Up; Gray Squares Denote Missing Data Points—Data Supplied by LOGSA

chosen by the DDOC, most initiatives focused on aligning strategic and operational assets to meet warfighter requirements. This research found few, if any, initiatives that directly impacted the processes of the *last tactical mile* with the exception of RFID tagging. In addition, the metrics used to evaluate the DDOC's success were based on programs initiated during the first DDOC rotation in January 2004. This research was unable to find any major initiatives implemented after the rotation of the first DDOC cadre suggesting that the DDOC could be an organization that deploys early in the flow and then those elements that are strategically focused may begin to retrograde back once the logistical infrastructure is established. This would return the theater to a joint movement center (JMC)-focused method for deployment and distribution control.

With these findings in mind, USTRANSCOM should consider future development of the JDDOC to reflect an organization that is used to overcome the realities of a limited movement of logistics assets early in the TPFDD flow. As the Secretary of Defense-designated distribution process owner, USTRANSCOM should maintain primary responsibility for future development and the establishment of standard operating procedures for the various geographically focused JDDOCs. In addition, the development of technology to support an ERP environment should remain with USTRANSCOM in order to ensure standardization across the various unified commands.

Proceeding with the development of JDDOCs in separate unified commands does present a few challenges. The first challenge of allowing DDOC development to take place in separate unified commands has to do with the difficulty in maintaining "habitual relationships and personnel training;" an issue cited as a gap in Joint logistics capability by LTG Christianson, the JS J4. Many of the initial successes of the DDOC were due to habitual relations formed by a relatively small number of Joint logistics professionals. As training packages are developed for future JDDOC implementation, the deployment and distribution community will have to focus on the development of habitual relationships that strengthen the ties between geographic combatant commands and those organizations and unified commands that support the strategic level of deployment and distribution.

Conclusion

The research conducted within this article attempted to answer the question of whether the implementation of the DDOC into USCENTCOM's theater substantially changed the Joint logistical process, or were improvements simply the result of application of logistical expertise focused on key problem areas. The research finds the latter to be more likely. It is to some degree a fundamental change as to how the deployment and distribution system is focused on warfighter priorities. It is, however, more the application of strategic logisticians brought together to form

a physical ERP to bring a common operating picture to the entire distribution community. The research was unable to answer the fundamental question of, "What if?"

The deployment of the DDOC into USCENTCOM's theater was a result of the shortcomings in the deployment and distribution system that came about due to a conscious delay in the deployment of logistical support into theater despite written doctrine to the contrary. What if US forces had deployed in accordance with doctrine and developed the prescribed logistical infrastructure that is fundamental to military operations? Would the DDOC concept have been necessary had a Theater Support Command and a fully supported joint movement center been put into position from the start of the operation? These two questions will remain unanswered. However, given that this new, doctrinally incorporated concept called a DDOC, was an organizational overlay to the JMC, TSC and air mobility division, and not a fundamental change to the logistics system, then what is to say that doctrine will be followed in the future? The challenge to future Joint military operations will be to maintain discipline in the system and execute Joint doctrine as it is written.

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Lieutenant Colonel Patrick X. Mordente, USAF, is a strategic planner with the Joint Staff J-5, Policy Division. At the time of the writing of this article, Lieutenant Colonel Mordente was a student at the Industrial College of the Armed Forces, National Defense University, Fort McNair, Washington, DC.

Dr Paul Needham is a professor of logistics and Director of the Supply Chain Management Concentration Program at the Industrial College of the Armed Forces. He is retired from the United States Air Force after serving 23 years in various logistics positions.

Colonel Theodore P. Ogren, USAF, is the Chairman of the Joint Chiefs of Staff Chair at the Industrial College of the Armed Forces (ICAF) and ICAF Exercise Director. Colonel Ogren is an F-16 pilot with over 3,000 flying hours, command experience, and he has served with the Coalition Provisional Authority in Baghdad, Iraq. He holds a bachelor of science degree in Mechanical Engineering from Lehigh University and a masters in National Resource Strategy from the Industrial College of the Armed Forces.





Routine

has its reasons.

Change isn't one.

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Lieutenant Colonel Paul R. Murphy, USAF

Introduction

On September 11, 2001 (9/11) the United States appeared powerless in the face of a sudden asymmetrical terrorist air attack on several key centers of national power. While the nation rallied in the wake of the attacks, most notably with heroic consequence management efforts in hardest-hit New York City, it also braced itself for follow-on incidents that could range from weapons-laden container ships through the specter of dirty bombs in the American heartland. The US defense establishment was hard pressed to explain how the mightiest military on earth had let the country down. Meanwhile, all departments of the Federal government scrambled to demonstrate resolve in cooperatively *fixing* the apparent breach in civil-military defenses.

Toward this effort, the United States reorganized its homeland support structure, creating the Department of Homeland Security (DHS) and establishing United States Northern Command (USNORTHCOM) as the single unified command for homeland defense and civil support.¹ To better organize itself for emergency response, the DHS integrated the Federal Emergency Management Agency (FEMA) and the United States Coast Guard.² These comprehensive changes to the national response structure were designed to increase overall responsiveness to catastrophic events whether caused by an act of terrorism or an act of nature. Yet, although no apparent follow-on deliberate attack has occurred since, the national-level crisis apparatus was tested in the Gulf Coast region of the United States in 2005 with the Hurricane Katrina disaster response, and found wanting—4 full years after 9/11.

The United States homeland security command architecture is extremely complex. Integrating a coherent strategic logistics management process to support this architecture is even more complex. The command architecture is so challenging that very few government officials fully understand how it currently works. Even Department of Defense (DoD) logistics experts are hard-pressed to differentiate parts of problems from parts of solutions. This article examines and synthesizes several essential research areas in order to form a comprehensive analysis of DoD's deployment and distribution architecture to support homeland security. It proposes that the Federal National Response Plan (NRP) is analogous to an interdepartmental coalition operation, and hence can learn from, and possibly model the attributes inherent in a military coalition structure. The analysis culminates with recommendations to enhance DoD's critical role in the homeland security architecture.

This research has three overarching conclusions. First, there is a demarcation of two concentric logistics and mobility



missions. One can be thought of as *tactical relief* operations inside the Joint task force (JTF) Joint operating area (JOA), while the other is the intratheater or *operational and strategic movement* via common-user, DoD airlift and other mobility assets. Second, this article concludes that the USNORTHCOM area of responsibility (AOR), in both the Homeland defense and Homeland security support mission realms, has a requirement for operational and strategic logistics and mobility management—

Acronyms

AEG - Air Expeditionary Groups
AMD - Air Mobility Division
AOC - Air Operations Center
AOR - Area of Responsibility
C2 - Command and Control
C3 - Command, Control, and Communications
COCOM - Combatant Commander
CONUS - Continental United States
CRG - Contingency Response Group
DDOC - Deployment and Distribution Center
DHS - Department of Homeland Security
DIRMOBFOR - Director of Mobility Forces
DoD - Department of Defense
ESF - Energy Support Function
FAA - Federal Aviation Administration
FEMA - Federal Emergency Management Agency
GPMRC - Global Patient Movement Requirements Center
HSOC - Homeland Security Operations Center
HSPD - Homeland Security Presidential Directive
ISR - Intelligence, Surveillance, and Reconnaissance
JFACC - Joint Forces Air Component Commander
JFCOM - Joint Forces Command
JOA - Joint Operating Area
JP - Joint Publication
JTF - Joint Task Force
LFA - Lead Federal Agency
MAF - Mobility Air Force
NDDOC - NORTHCOM Deployment and Distribution Center
NIMS - National Incident Management System
NORAD - North American Air Defense Command
NRP - National Response Plan
SAC - Strategic Air Command
TACC - Tanker Airlift Control Center
TALCE - Tanker Airlift Control Elements
UCP - United Command Plan
USCENTCOM - United States Central Command
USEUCOM - United States European Command
USNORTHCOM - United States Northern Command
USPACOM - United States Pacific Command
USSOCOM - United States Special Operations Command
USSOUTHCOM - United States Southern Command
USSPACECOM - United States Space Command
USSTRATCOM - United States Strategic Command
USTRANSCOM - United States Transportation Command

these are within the purview of United States Transportation Command (USTRANSCOM). These functions need not be replicated by USNORTHCOM because they are already resident at USTRANSCOM. Third, operational and strategic logistical and mobility planning for incidents of national significance cannot wait until requests are made by overwhelmed lead federal agencies.

Analysis begins with a review of the legal foundation that established the framework for the DHS and the rules that guide the federal response architecture. It includes the presidential directives and legal underpinnings most important to DoD support of civilian and military authorities. Next, it lays out the national-level *solution* of federal reorganization designed to foster closer interagency cooperation. It explains the national incident response structure within which DoD is expected to serve as a support functionary.

Next, the article discusses the fundamental differences of the principles of unity of effort and unity of command to explore the limitations on civil-military cooperative command arrangements. The article dwells on the purpose, history, and structure of the unified command plan (UCP) in order to comprehend the military's worldwide organizational architecture and USNORTHCOM's and USTRANSCOM's respective positions within it. The history of the UCP reveals how DoD organization has developed to support operations inside North America, both for homeland defense and for supporting civilian authorities. Further the UCP allows mission-specific divisions inside the United States that are unique to the homeland AOR. It also touches on the distinguishing characteristics of geographic and functional commands in order to highlight the nuances of supporting operations inside sovereign US territory.

Third, it assesses how DoD, USNORTHCOM specifically, integrates into the newly established response system and the interagency unity of effort and unity of command challenges that come with domestic military endeavors. Fourth, for a practical assessment, this article analyzes the military deployment and distribution operations in support of the relief efforts for Hurricane Katrina and Operation Unified Assistance, the US-led international relief effort following the Indian Ocean tsunami of December 2004.

Finally, the article draws conclusions from the striking similarities between the strategic and tactical logistical issues of both the international and domestic relief efforts. It explores the overarching issue of end-to-end strategic logistics management and the associated division of civil-military responsibilities therein, with respect to large-scale catastrophic relief operations.

National Legal Framework

The national legal framework deliberately places restrictions on the US military for operations outside of overt *defense* in the strictest sense. Operations conducted on US sovereign soil are legally constrained to a significant degree. There are a variety of governing documents that guide homeland security mission areas.³ Two of the core purposes laid out in the preamble of the United States Constitution state that its very purpose is to ensure domestic tranquility and provide for the common defense. The specific language in the body of the Constitution explicitly divides powers to do so. For example, the Congress has the power

to declare war, raise and support armies, provide and maintain a Navy, and provide for calling forth the militia to execute the laws of the Union, suppress insurrections, and repel invasions. Meanwhile, the President is designated as the Commander in Chief of all the Armed Forces. Therefore, the Constitution itself is the cornerstone justification for the US military's role in homeland defense and homeland security.⁴

Legal Underpinnings of DoD Support to Homeland Security

The DoD fulfills two baseline missions in support of homeland security. The more straightforward military mission of homeland defense is to defeat conventional threats on the sea, land, and aerospace approaches to the United States under direct orders of the President or Secretary of Defense (SECDEF).⁵ By contrast, the homeland security mission of defense support to civil authorities is pursuant to a number of federal legal restrictions designed to safeguard military capabilities from misuse by civilian agencies and military abuse of civilians.⁶ In fact, it might surprise the US public to learn what a tiny fraction of its continental United States (CONUS) based military is actively involved in homeland security operations. Moreover, the US public may assume unreasonable expectations of what its military can and cannot do for them—even in crisis.

Over the last two centuries civil and military laws have expanded geometrically. Several pieces of federal legislation and their associated definitions are noteworthy, especially for their impact on the use of the US military for homeland defense and homeland security support. First, the Robert T. Stafford Disaster Relief and Emergency Assistance Act authorizes the Federal government to provide supplemental assistance to state and local governments for relief from major disasters or emergencies.⁷ Specifically the President may direct any federal agency, including DoD, to take “special measures, designed to assist the efforts of the affected states in expediting the rendering of aid, assistance, emergency services, and the reconstruction and rehabilitation of devastated areas.”⁸

The Stafford Act is the primary legal authority for federal participation in domestic disaster relief. There are three scenarios in which the DoD may be directed to provide assistance.

- A presidential declaration of a *major disaster*
- A presidential order to perform emergency work for the preservation of life and property
- A presidential declaration of an *emergency*⁹

The Stafford Act and the NRP offer detailed definitions for a federal emergency and a major disaster. A federal emergency is:

Any occasion or instance for which, in the determination of the President, federal assistance is needed to supplement state and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen (or to avert) the threat of a catastrophe in any part of the United States.¹⁰

Whereas a major disaster is described as:

Any natural catastrophe (including hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or regardless of cause, any fire, flood or explosion, in any part of the United States, which in the determination of the President causes damage in

sufficient severity and magnitude to warrant major disaster assistance under this act to supplement the efforts and available resources of the States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby.

In similar fashion, the Homeland Security Presidential Directive (HSPD)-5 establishes threshold criteria for an event to qualify as an *incident of national significance* warranting a coordinated federal response. The NRP defines an incident of national significance as:

An actual or potential high-impact event that requires a coordinated and effective response by an appropriate combination of federal, state, local, tribal, nongovernment, or private sector entities in order to save lives and minimize damage, and provide the basis for long-term community recovery and mitigation activities.

These federal declarations, and the subsequent level of assistance, are graduated in nature. Emergencies differ from major disasters in that they do not require a specific causal event and are limited in the level of federal assistance rendered. Emergency assistance is limited to \$5 million without specific Congressional approval to exceed this amount.¹¹ Major disasters, by definition, are event-related and natural in origin. To qualify as an incident of national significance, an event must meet one of four criteria.

- A responding federal department or agency must request the assistance of the Secretary of Homeland Security.
- The State and local authorities must be overwhelmed and have sought federal assistance through the appropriate channels.
- More than one federal department or agency is substantially involved in responding to the incident.
- The Secretary of Homeland Security has been designated by the President as the manager for the domestic incident.¹²

In addition to the Stafford Act, under certain situations, the Economy Act can be invoked to expedite assistance.¹³ The Economy Act allows one federal agency to acquire goods or services from another federal agency provided the requested goods or services cannot be obtained by other means. By invoking this act, a federal agency can request DoD support without a Presidential declaration of an emergency as required by the Stafford Act. Four criteria must be met to invoke the Economy Act.

- The amount (goods) for the purchase must be available.
- The purchase must be in the best interest of the government.
- The goods or services cannot be provided by a contract from a commercial enterprise.
- The agency filling the request must be able to provide or contract for the goods or services.¹⁴

The Homeland Security Act

The Homeland Security Act of 2002 and the HSPD-5 established the DHS to be the Federal government's “focal point regarding natural and manmade crises and emergency planning.”¹⁵ The Secretary of the DHS is designated as the principal federal official for domestic incident management. In this role, the Secretary is also responsible for “coordinating federal resources utilized in response to or recovery from terrorist attacks, major disasters, or other emergencies” when organic state resources are overwhelmed or as directed.¹⁶ In short, the DHS is termed the

lead federal agency for both planning and response management of homeland security.

The overarching national *solution* to cope with the stove-piped nature of the federal government was the establishment of the DHS itself. Further, the most critical document for achieving forward progress has proven to be HSPD-5. It directed the development and implementation of the NRP, and is predicated on a new “National Incident Management System (NIMS), which aligns the patchwork of federal special-purpose incident management and emergency response plans into an effective and efficient structure.”¹⁷ The NRP and NIMS are an ambitious attempt to provide a comprehensive *national framework* for integrating various plans and organizations involved in crisis planning and response.¹⁸ The NRP attempts to put order on the chaotic confluence of agency interrelationships. The NIMS attempts to draw a template for incident response. In a simple example, the NIMS prescribes national standard radio communication language guidelines for all emergency responders to adhere to. This is designed to limit confusing localisms in crisis-situation terminology and to foster interoperability at all levels of government in case an incident expands across multiple jurisdictions.¹⁹

The NRP assigns lead federal agency (LFA) responsibilities for 15 various types of responses in the form of a matrix containing emergency support function (ESF) annexes which show each applicable *primary agency* (or LFA), and which agencies are tasked to provide support to it.²⁰ Of the 15 ESFs, DoD is only the LFA for *public works and engineering*, yet DoD is an integral part of the supporting matrix to every other ESF

(see Figure 1).²¹ In short, DoD will always have a support role regardless of the nature of the emergency.

The ESF annexes are the organizational means for an integrated federal response to incidents of national significance. They provide for federal-to-state, and federal-to-federal interagency support.²² Each function has a coordinator responsible for all phases of incident management from prevention and preparedness to recovery and mitigation. The coordinator conducts planning and coordination activities on a scheduled basis with support agencies and private sector organizations.²³ The coordinator fills a central role in the organizational foundation of each ESF. A successful response to an incident may very well rest on the level of preparedness and leadership skills at this critical coordination position.

When an incident occurs, the response system activates across the federal and regional levels. The process starts at the Homeland Security Operations Center (HSOC) when the National Response Coordination Center initiates individual ESFs in response to an incident of national significance. The designated ESF primary agencies respond accordingly, activating the appropriate level of responders and support agencies to include the regional echelon through standardized protocols and operating procedures.²⁴ The goal is a seamless response system implemented across all agencies, primary and support.

National Response Chain

When an incident becomes a large-scale catastrophe, it will most likely overwhelm state and local emergency responders in short order. In general, these personnel simply do not have the

Agency	Emergency Support Functions														
	#1 - Transportation	#2 - Communications	#3 - Public Works and Engineering	#4 - Firefighting	#5 - Emergency Management	#6 - Mass Care, Housing, and Human Services	#7 - Resource Support	#8 - Public Health and Medical Services	#9 - Urban Search and Rescue	#10 - Oil and Hazardous Materials Response	#11 - Agriculture and Natural Resources	#12 - Energy	#13 - Public Safety and Security	#14 - Long-term Community Recovery and Mitigation	#15 - External Affairs
USDA			S		S	S		S		S	C/P	S		P	S
USDA/FS	S	S	S	C/P	S	S	S	S	S	S			S		
DOC	S	S	S	S	S		S	S	S	S	S	S	S	P/S	S
DOD	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
DOD/USACE			C/P	S	S	S		S	S	S	S	S	S	S	
ED					S										S
DOE	S		S		S		S	S		S	S	C/P	S	S	S
HHS			S		S	S		C/P	S	S	S			P/S	S
DHS	S	S	S		S	S	S	S	S	S	S	S	C/P/S	S	C
DHS/EPR/FEMA		S	P	S	C/P	C/P			C/P	S				C/P	P
DHS/IAIP/NCS		C/P										S			
DHS/USCG	S		S	S				S	S	P			S		
HUD					S	S								P	S
DOI	S	S	S	S	S	S				S	P	S	S	S	S
DOJ	S				S	S		S	S	S	S		C/P/S		S
DOL			S		S	S	S	S	S	S	S	S		S	S

C = ESF coordination
P = Primary agency
S = Support agency

Note: Unless a specific component of a department or agency is the ESF coordinator or a primary agency, it is not listed in this chart. Refer to the ESF annexes for detailed support by each of these departments or agencies.

Figure 1. Designation of ESF Coordinator and Primary and Support Agencies

manpower or equipment to react in a sufficient and timely manner. Federal assistance is obtained through a reactive process triggered by a request for assistance initiated at the state level. The NRP states a governor “requests federal assistance when it becomes clear that state or tribal capabilities will be insufficient or have been exceeded or exhausted.”²⁵

After an event has occurred, a series of responses and assessments guide the process of obtaining external assistance. First responders to any incident will always be local emergency personnel. These individuals work through the local emergency operations center assessing the extent of the incident in an attempt to determine the level of response required. These initial assessment actions are below the state level with local officials as the incident managers. As the scope of the incident exceeds the capacity of local responders, local authorities request state assistance from the governor through the state emergency operations center. The governor determines if the situation warrants a declaration of a state emergency.²⁶

When the governor declares a state of emergency, he or she also notifies the regional FEMA director, who in turn, notifies the FEMA Director, and in turn, the Secretary of Homeland Security through the HSOC. The operations center evaluates the situation and prepares recommendations for the Secretary and potential presentation to the President. The governor also requests a joint State and DHS Preliminary Damage assessment to determine if the emergency merits a federal emergency or major disaster declaration by the President under the provisions of the Stafford Act (see Figure 2).²⁷

It is not inconceivable that a large-scale disaster will overwhelm the capabilities of most organizations. This is where the sheer magnitude and extensive logistics and mobility capabilities of DoD are recognizably unmatched, making it the ideal support element for every ESF of the NRP. Ancillary to its warfighting role, the DoD has a long history of national preparedness and domestic operations often overshadowed by its combat architecture. To further illustrate this point, the next section explores the foundational elements of DoD’s strength, the origins of the UCP structure, and the development of USNORTHCOM as a domestic combatant command.

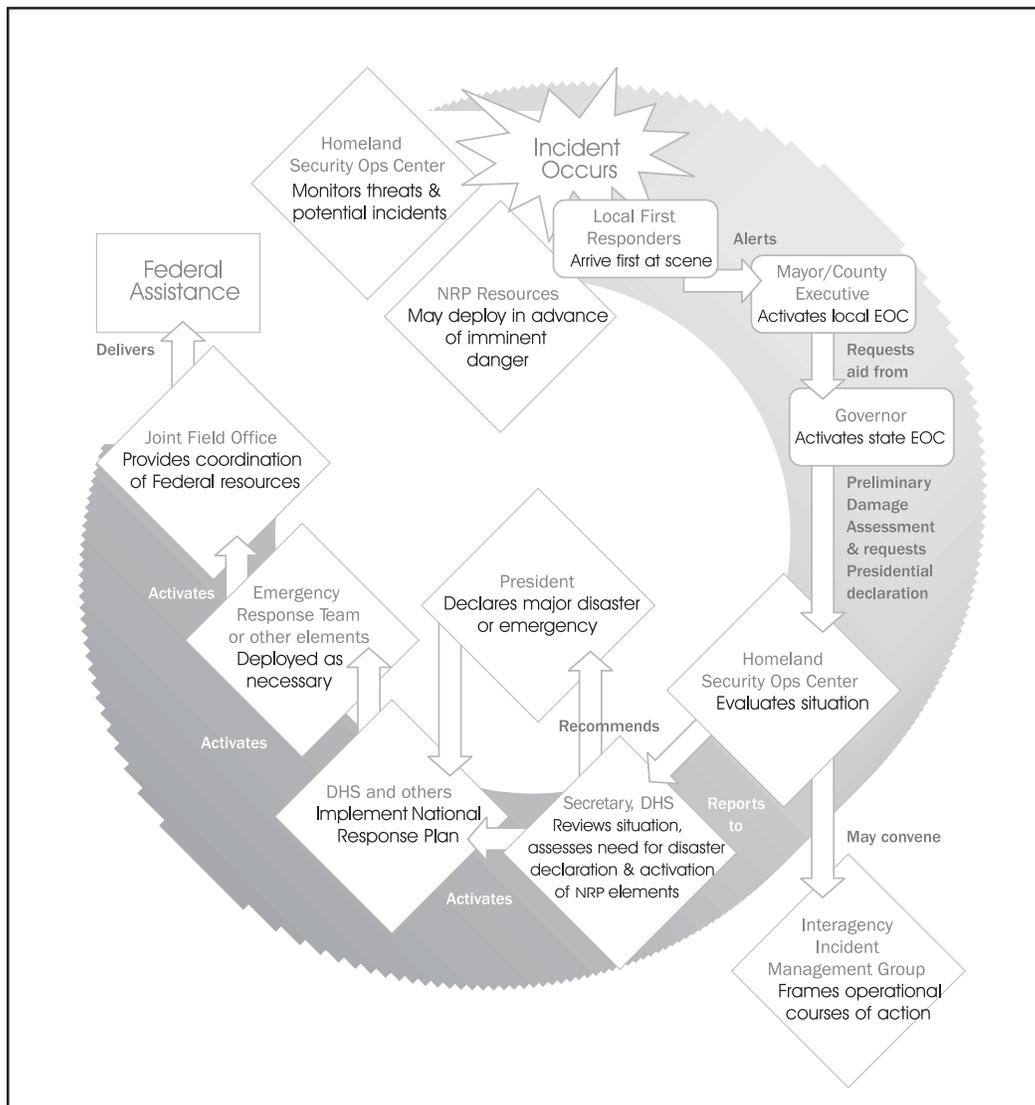


Figure 2. Federal Involvement Under the Stafford Act

DoD Framework

Unity of Command Versus Unity of Effort

Although HSPD-5 and related national guidance describe interdepartment support, cooperation and coordination processes in terms of “unity of effort,” only DoD maintains the legal framework for “unity of command.” Moreover, DoD is legally bound by Title 10 United States Code authority to always maintain a clear chain of military command regardless of the mission or task being performed. To the military, unity of command is sacrosanct. No Service member can be unattached or take direct orders from a member of another federal agency. Further, the Title 10 chain of command can always be drawn from the airman to the President, or under Title 32 from the airman to his or her Governor. To emphasize this critical point HSPD-5 clarifies: “Nothing in this directive impairs or otherwise affects the authority of . . . the chain of command for military forces.”²⁸

The military, unlike its federal partners, holds that “command is central to all military action, and unity of command is central to unity of effort.”²⁹ For the military, it is the essential authority that a military commander “lawfully exercises over subordinates” to assign missions—and to “demand accountability for their attainment.”³⁰ Joint Publication (JP) 0-2, *Unified Action Armed*

Services, defines unity of command as the “necessary interlocking web of responsibility” that makes unified action viable.³¹ This reflects a difference in perspective between the military and civil servants. Civilian officials certainly rely on unity of effort, yet even law enforcement and firefighters can quit or refuse duty without serious legal repercussion. By contrast, the military member is duty-bound to carry out legal orders. Therefore, who takes orders from whom, matters more inside a purely military hierarchy than in a civilian equivalent. Given the heavy burden of responsibility inherent in such powers, a very clear chain of command is required at all times.

The fact that the civil side of the federal government does not have a clear and codified interdepartmental chain of command, in the Title 10 sense, is a major problem in terms of homeland security. This presents challenges for integrated federal operations where collaborative operations involve both civilian and military personnel. Civilian departments are familiar with this type of interagency environment, despite the obvious inherent inefficiencies. Paradoxically, the DoD, which is most accustomed to clear lines of command and control (C2), is arguably furthest ahead of all federal departments in anticipating disconnects and working within a nonunified command chain. The DoD has gone so far as to codify its wisdom in Joint Publication (JP) 3-08, *Interagency Coordination During Joint Operations*. While not perfect, at a minimum it offers to the DoD Joint community the limitations and nuances of working with external agencies in both planning and execution of complex operations. No such document exists for the federal government in general.

The Unified Command Plan Architecture

Of all federal departments, the DoD has the most unique structural principles. Doctrine governs that military forces be organized on either a geographic or functional basis.³² This is spelled out in the UCP, which is the overarching directive that establishes the worldwide architecture of geographic areas of responsibility and functional missions assigned to operational US combatant commanders. The latter alone are given Title 10 combatant command (COCOM) authority to control operational forces.³³ Moreover, the essential role of the Army, Air Force, Navy and Marine Corps Services is to recruit, train, and equip their respective forces for use by the COCOMs. Thus, the Chiefs of Staff of the various Services, all holding the ultimate leadership position achievable for that Service, have in fact no direct role in conducting military operations. Furthermore, the unified commanders themselves only have COCOM of forces assigned to them by a governing DoD *forces for* document. Each command executes operations using standard DoD command, control, and communication (C3) architectures. The current version of the UCP contains five geographic and four functional commands (a new US Africa Command will be created by the end of fiscal year 2008). The geographic commands illustrated in Figure 4 are reminiscent of maps of the Roman Empire, and serve a similar function for US military operations. In short, the commander of each AOR is responsible for all day-to-day Joint operations inside his respective AOR.³⁵ Additionally, the geographic commands lead planning and political-military *engagement* activities with

resident nations. To respond to localized crisis situations or to accomplish specific tasks, combatant commanders are expected to assign either subunified commands or JTFs to concentrate effort without detracting from their broad and continuing AOR missions. For example, US Central Command (USCENTCOM) currently has three JTFs operating simultaneously within its AOR for separate operations inside Afghanistan, Iraq and the Horn of Africa.

By contrast, functional commands control Joint forces performing specific types of continuous military operations without respect to a specific geographic region.³⁷ The UCP’s four current functional command names reflect their unique missions: transportation (USTRANSCOM), special operations (USSOCOM), strategic (USSTRATCOM) and Joint forces (JFCOM). Moreover, each functional command has its own worldwide C3 architecture, and each mutually supports all other unified commands as directed. For example, USTRANSCOM’s mission is to “provide air, land and sea transportation for the DoD, both in time of peace and time of war.”³⁸

Finally, it is important to understand that the President, as commander-in-chief of the armed forces, is granted the establishment authority to reorder the US geographic military *empire* whenever he sees fit.³⁹ For example, as the UCP map (Figure 3) reveals, prior to 9/11 there was no geographic commander with command of Joint force operations in and around North America. Yet, one year later the UCP architecture had been rapidly adjusted (figure 4).⁴⁰ This begs two questions. First, was a catastrophic attack necessary to highlight the American *open gap* in the otherwise comprehensive UCP? Second, why was America initially *uncovered* in the UCP?

UCP Background

The original goal of the UCP was to preserve the conflict-proven structural framework that was built during the multitheater Second World War. The hard experience of the conflict validated the need for a peacetime military command structure that locked in the wartime proven benefits of *Joint* unity of command. In 1946 the first *UCP* (known as the Outline Command Plan) was approved by President Truman. It established seven unified commands, each with a specific AOR and a set of specified missions. Fifty-nine years later, despite substantial revision and realignment, the basic UCP architectural concept has survived.⁴¹

The map in Figure 3 shows the delineated AORs of the five geographic commands prior to 9/11: JFCOM, USCENTCOM, US Southern Command (USSOUTHCOM), US European Command (USEUCOM) and US Pacific Command (USPACOM). The two obvious *unassigned* territorial gaps were North America and the former Soviet Union. The latter, comprising the Russian region, remained unassigned as much for its sheer size (it spanned 12 Eurasian time zones) as for its status as a superpower. As the *box* occupied by the very target of the Cold War grand strategy of containment, it was too much of a leviathan to assign to a single geographic command’s AOR. In that sense, the pre-9/11 UCP effectively illustrates the military bulwark around the periphery of the Warsaw Pact adversary. Thus, this geographic UCP gap made sense. By contrast the other glaring exception, North America, had no valid military rationale. In fact, it ran counter to the principles of unity of effort and unity of command that were, and are the underpinnings of the UCP architecture.

The North American omission was maintained for a variety of political reasons. First, 60 years ago, there was no viable threat to the secure post-war strategic position of the North American continent. Second, the civil-law legacy of concern over *Posse Comitatus* and suspicion of military interference with *internal affairs* hampered advocacy of including the continental United States in the plan. Third, the very powerful Armed Services were less than enthusiastic about subjecting their own forces at home, *in garrison*, to a Joint commander from a sister service—especially in the heyday of interservice rivalry. Fourth, the prospect of a *commander in chief* with such an all-important AOR would likely be viewed as first among equals, with responsibilities eclipsing all other combatant commanders. There was also fear that such a position would rival the Chairman of the Joint Chiefs of Staff (CJCS) himself. Yet, in the final analysis, all these reasons (and the list is not exhaustive) prove to be grounded more in internal DoD politics than in any military practicality.⁴²

At the UCP's inception, four of the first seven commands (Alaskan, Northeast, Atlantic, and Caribbean Commands) were located in, or tangential to, North America and had collective responsibilities equating to the de facto defense of the continent.⁴³ While this division was a low-risk proposition in the late 1940s, as time went on the UCP structure was repeatedly forced by *operational military necessity* to be continually adjusted. For example, in 1954, the emerging threat of Russian atomic bomber attack moved the Eisenhower administration and the Joint Chiefs of Staff (JCS) to form the Continental Air Defense Command (CONAD). Three years later in 1957, as a result of Sputnik and the emergence of an intercontinental ballistic missile threat to North America, the North American Air Defense Command (NORAD) was established to extend aerospace early warning and air defense across the CONUS, Canada, and Alaska. Therefore, a Joint force commander with the entire North American continent as an

assigned AOR, has been in existence since the 1950s, albeit solely in the realm of air and space *approaches*. Furthermore, hypothetically, had the Soviet threat included a viable land invasion route for massed tank armies across the North pole, a comprehensive air, land, and sea forces Joint command for North America would, of necessity, likely have been organized. In the final analysis then, the reality has been to limit the homeland

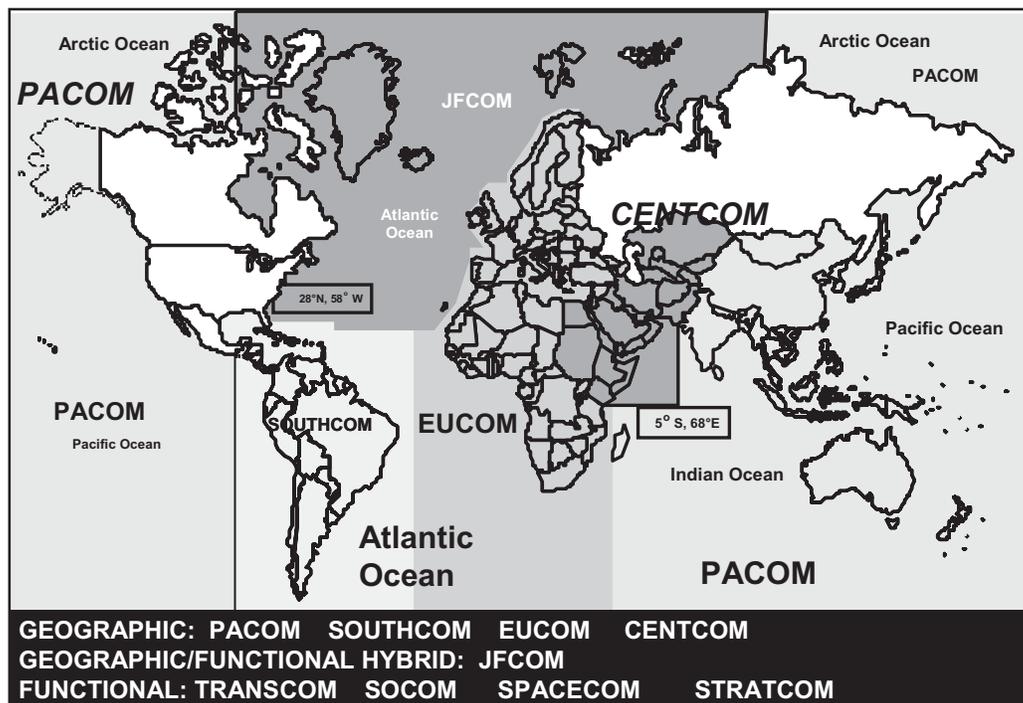


Figure 3. The Unified Command Plan on 11 Sep 2001.³⁴

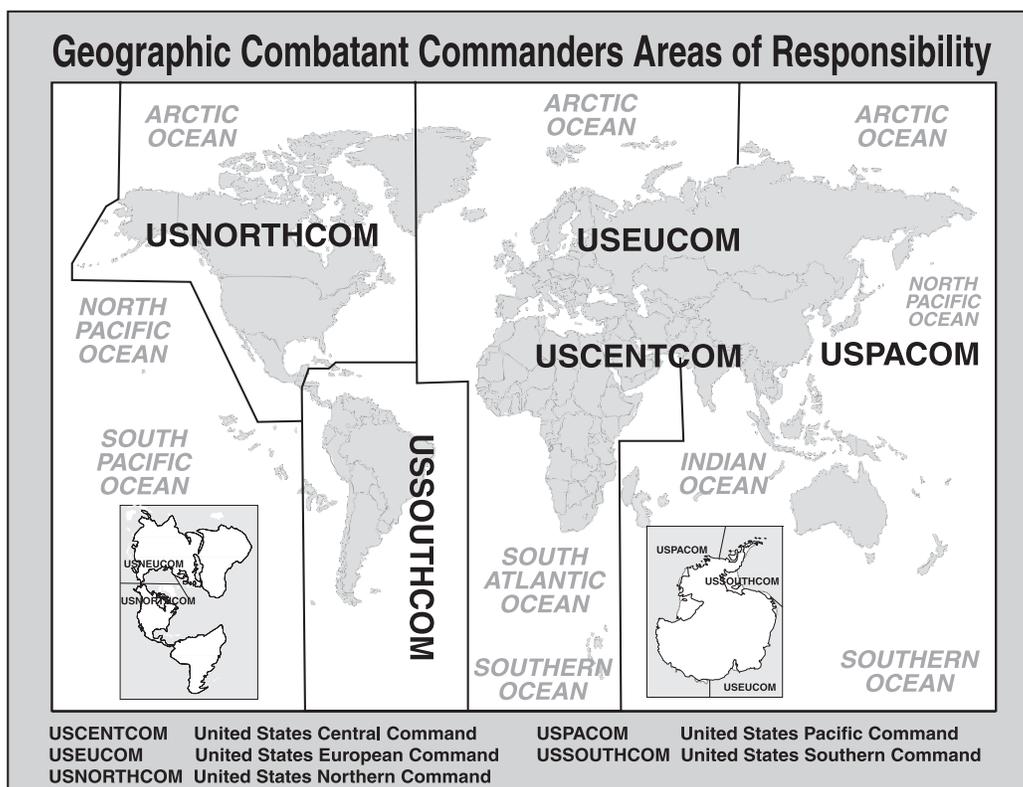


Figure 4. The Current Unified Command Plan (New US Africa Command to be Created by the End of Fiscal Year 2008)³⁶

UCP geographic region to be organized solely upon defense, and only as a last resort.

Technically, defense is only half of the equation for any geographic commander. The other half is the capability to plan and conduct offensive operations to deter, and failing that, defeat the same enemy you are defending against. For North America in the post-war period, *strategic* offensive power originating in the CONUS equated to the capability to deliver nuclear weapons to any threat-nation on earth, starting with the Soviet Union and later extending to China and elsewhere. Into the mid 1950s, Air Force heavy bombers were the sole delivery systems for atomic weapons. For this reason, the Air Force's Strategic Air Command (SAC) was designated as the first *specified command*—an older concept not in current use that controls only the forces of a single service to accomplish its mission.

The example of SAC is a telling historical lesson in what types of C3 arrangements can be constructed to accomplish a mission deemed critical to national security. As the primary commander charged with offensive strategic weapons delivery prior to the advent of the strategic triad, the Commander-in-Chief, Strategic Air Command (CINCSAC) had awesome (some would argue dangerous) responsibility. In the era of deterrence through *massive retaliation*, an immense responsibility rested on the shoulders of a single-point *offensive* commander who resided inside the CONUS, but whose mission was both global and continuous. Congress and the rest of the Services objected to the disproportionate funding (half of the entire DoD budget) SAC required in the 1950s, but given the gravity of the mission, all understood that a crystal clear, tightly-controlled chain of command was in order. In short, it was once again an operational necessity for such an architecture given the extreme reaction times required to effectively respond to—and thereby deter—a Soviet strategic nuclear attack.

Unfortunately, given the safeguards involved in nuclear offensive operations, and the concomitant requirement for survivable and instantaneous *fail-safe* communications, the C3 architecture of the US offensive forces has been intentionally stove-piped from the C3 of the strategic defense which complements it. The offensive operations of SAC which stood ready to respond in minutes and the defensive operations of NORAD, also postured on alert, were and still are entirely bifurcated and relatively oblivious to each other's operational plans and tactical procedures.

The salient rationale for this self-inflicted disunity of command is the Canadian government's recalcitrance to be integrated into a command that is designed to conduct offensive nuclear operations of any sort. Given the geographical realities of Canada's territorial juxtaposition between the United States and Soviet Union, this price continues to be paid. Yet, it would be ludicrous to divide offensive and defensive military operations in any other theater. For example, would it make sense if the USCENTCOM AOR were divided into an offensive command and a defensive command with entirely separated and stovepiped C3? It would not be logical to order the offensive command to launch a campaign of invasion, while a defensive command dealt only with enemy counter-attacks. Wartime operations would be hopelessly confused and overlap everywhere in the AOR. Yet, that is precisely the structure that existed from the 1950s through to the end of the Cold War. Furthermore, this inherent dichotomy in our strategic planning

is essentially invisible. Its fundamental C3 flaws will only be apparent upon execution.

If nothing else, this doomsday scenario illustrates the level of national acceptance in operational design flaws prior to 9/11. Given that the Cold War strategic landscape dictated a strategy of offensive deterrence at the expense of true unified Joint strategic warfighting capability, design flaws in the latter area are at least understandable. However, the baseline assumption to this line of reasoning is that actual real-world execution would never happen. For if *the unthinkable* did happen, the Soviets would suffer unacceptable damage via the nation-ending lethality of the offensive arm. The problem is that the Cold War baseline assumptions have melted away in the face of asymmetric, nonstate actors who have already demonstrated the will and acumen for mounting real-world unthinkable attacks on sovereign American territory. Therefore, the paradigms that allowed military disunity of command and uncentralized Joint coordination at the operational level should have been swept away with the Cold War. In the final analysis, the fall of the Soviet Union did, in fact, drive a relook at the American UCP architecture, but it was done for decidedly nonoperational reasons.

Closing the North American Gap Prior to 9/11

In the decade prior to 9/11 the JCS began consideration of how to restructure the Cold War UCP to cope with an expected drawdown in forces based overseas. Of immediate concern was how to organize the substantial forces slated to return to permanent CONUS garrisons. This helped to propel a proposal for an all new geographic *Americas Command* that would have included all of North and South America, with the exception of Alaska. USSOUTHCOM was to be disestablished. It proposed to combine Army Forces Command, Tactical Air Command (later Air Combat Command), Atlantic Fleet, and Marine Forces Atlantic as its Service components.⁴⁴ However, the proposal was not oriented on missions in and around America, but rather to place all CONUS-based forces under one command as a Joint force manager to support contingencies around the globe. As a functional combatant command it would have responsibility for "Joint training, force packaging, and facilitating deployments of designated CONUS forces."⁴⁵ It was also designed to serve as the central manager of Joint force integration and experimentation. The extent of its CONUS operational mission was to lend support to domestic agencies for disaster relief and civil support.⁴⁶

The proposal for an Americas Command eventually resulted in the stand-up of JFCOM, but it faced modification and compromise in the process. Its proposed geographic area was curtailed by the retention of a separate USSOUTHCOM when it was deemed necessary for regional engagement purposes to retain it intact. Also, rather than create an all new command, General Powell, the CJCS at the time, selected the existing Atlantic Command (LANTCOM) as the most favorable alternative to build upon. Because it was a patchwork compromise, the new commander had to add the above-mentioned missions to his existing duties as NATO Supreme Allied Commander Atlantic (SACLANT). Thus, the command was a cobbled together hybrid of geographic and functional missions.⁴⁷

This analysis of the UCP architecture for North America leads to three overall observations. First, the benefits of unity of

command in and around North America have been repeatedly compromised for largely political reasons. Second, true geographic unity of effort and command have been lacking inside North America, given that the missions of homeland defense and the equivalent of *homeland offense* have been assigned to separate commands. Finally, any time there has been proof of operational necessity, substantial adjustments to the North American UCP architecture have been made in order to adapt to emerging mission areas. Of these, the last is the most important. It means that the DoD homeland UCP architecture, and by extension the subsystem constructs within it, have always been malleable. Therefore, when circumstances dictate, there should be no hesitation to make requisite changes as quickly and efficiently as possible.

Support to the Department of Homeland Security

Military Architecture in Support of DHS

The 9/11 attacks were followed by political anger and dismay at the lack of federal interagency coordination in both intelligence and counterterrorism. Local agency first responders in both New York City and Washington, DC experienced acute difficulties in communications. The US military, used to meting out precision strikes, received a taste of its own medicine when its central C2 node, the Pentagon, received a direct hit from the air. Even the

In April 2002, President Bush signed the 2002 revision to the UCP. It contained his executive decision to establish US Northern Command (USNORTHCOM) with geographic responsibility for homeland defense and civil support operations. The new command relieved Joint Forces Command of the homeland defense mission and inherited and modified the air sovereignty mission of NORAD.⁴⁹ The USNORTHCOM AOR encompassed the continental United States, Alaska, Canada, Mexico, and the air, land, and sea approaches including waters out to approximately 500 nautical miles. It also included the Gulf of Mexico, Cuba, Puerto Rico and the US Virgin Islands. The defense of Hawaii and Pacific territories remains the responsibility of the US Pacific Command (see Figure 4).⁵⁰ According to its mission statement USNORTHCOM “conducts operations to deter, prevent, and defeat threats and aggression aimed at the United States, its territories, and interests within the assigned area of responsibility ... and, as directed by the President, or Secretary of Defense, provide defense support of civil authorities including consequence management.”⁵¹

The commander of USNORTHCOM is dual billeted as the US commander of NORAD. While not the air component of USNORTHCOM, the NORAD C3 infrastructure effectively functions in both roles as well. By long-standing bilateral agreement, NORAD is confined to only aerospace early warning and enforcing “control of the skies over the United States and Canada” not the above, more extensive USNORTHCOM AOR.⁵²

The DoD homeland UCP architecture, and by extension the subsystem constructs within it, have always been malleable. Therefore, when circumstances dictate, there should be no hesitation to make requisite changes as quickly and efficiently as possible.

otherwise quick response launch of NORAD fighters was too little, too late. From local through federal levels, it was apparent that the interagency security apparatus of the United States was in need of critical examination. The President vowed both retribution and rapid reformation of the overall national security infrastructure.

The DoD’s game plan for homeland defense was a top down restructuring of its Joint posture. The 9/11 attacks swept away lingering opposition to the idea of an American unified command on US domestic territory. Within weeks all senior DoD officials, including the unified commanders were solicited for recommended changes in the UCP architecture. Multiple proposals were forthcoming, including one for a *North American Command* that would have absorbed both NORAD and STRATCOM to achieve unity of Joint offensive and defensive operations at the national strategic level. However, opposition to this unity of command initiative was a prospective Canadian objection to integrated involvement in a command that was in control of offensive nuclear operations. This may have caused their withdrawal from the critical defensive-only NORAD coalition. Since the actual executive-level deliberations were top secret, it will likely be some years before all considered UCP courses of action are revealed.⁴⁸

While this arrangement is virtually invisible in the purely defensive role, many of the functions of a standard geographic AOR air component are missing. First, there is a glaring lack of integration with the offensive air component whose C3 belongs to STRATCOM as discussed in the previous section on DoD framework. Second, USNORTHCOM has a severely limited capability for planning and executing its own AOR’s intratheater air mobility operations.

With the assignment of Russia to EUCOM and the stand-up of USNORTHCOM, the 2002 UCP finally closed the remaining geographic command AOR gaps. However, it also contained major revisions to the functional commands with equities inside the USNORTHCOM AOR. First, it removed JFCOM’s geographic command area responsibilities by transferring it to USNORTHCOM (see Figures 3 and 4).⁵³ Second, it ordered US Space Command (USSPACECOM) to stand down and transfer its core missions to USSTRATCOM, with the exception of NORAD functions which were transferred to USNORTHCOM. Third, the detachment of NORAD to USNORTHCOM reconfirmed the separation of strategic defensive operations from national strategic offensive operations controlled by USSTRATCOM. In no other AOR are offense and defensive operations intentionally

stovepiped at the operational, planning, execution, and C3 levels. Finally, the 2002 UCP dissolution of USSPACECOM was a matter of choice, not necessity. The expansion of the USSTRATCOM mission set was part of the long-range vision of Defense Secretary Rumsfeld who used the necessity of establishing a headquarters for an all new USNORTHCOM as leverage to disassemble USSPACECOM. The UCP maintained the previous number of nine unified commands, thereby minimizing the costs of associated staff *overhead*.⁵⁴

The sweeping UCP reorganizations also created turbulence at the headquarters of all affected unified commands at the very time the military was ramping up to support the Global War on Terror, including operations in Afghanistan. Meanwhile, USNORTHCOM's initial cadre of Joint staffers were consumed with forming a working organization internally, while keeping abreast of the wider federal homeland security reorganization efforts underway externally.

Further, USNORTHCOM, the command singularly dedicated to homeland security operations, reached operational capability in 2003 with little more than the ex-JFCOM JTF-Civil Support and JTF-6 (counter-drug operations support) as its main tactical units. Although USNORTHCOM is given priority for the forces it requests, it tactically controls very few forces day-to-day. In fact, it technically has no assigned or apportioned forces whatsoever. In this sense, it is very much a *paper command*.⁵⁵ Moreover, its Service component commanders are *dual-hatted* with primary duties elsewhere. For example, its 1st Army land component is primarily for training—not for homeland defense or civil support execution.⁵⁶

The USNORTHCOM of 2005 is more robust, but its operations are still relatively narrow in scope. In its defense support to civil authority mission, the command provides support to federal agencies through established Joint task forces. Currently these forces are organized into five distinctive areas or missions: Standing JTF Headquarters North; JTF Civil Support; JTF Alaska; JTF North, and Joint Forces Headquarters, National Capital Region.⁵⁷ Unfortunately, USNORTHCOM's task-organized defense and support missions somewhat undermine its basic reason for existing—military unity of command and effort. Due to the dissimilar nature of its unique mission sets, USNORTHCOM's air, land, and sea components must each be independently organized to perform what are disparate missions. For example, the air component is primarily focused on air sovereignty. Its JTF-Civil Support has specific tasks for chemical, biological, radiological, nuclear, and high explosive (CBRNE) detection and consequence management. As a result, rather than training, exercising, and operating as a geographic Joint force, USNORTHCOM forces are spread into specific mission areas, effectively stovepiping their operational C2.

USNORTHCOM is unique in that it either borders with, or is host to the headquarters of, the other eight unified commands. Since all commands are stakeholders in defending the homeland, this should, in theory, foster good *interior lines* of communications. Yet, the intentional *use only as a last resort* language at the heart of its homeland security charter, coupled with the minimum *only as required* force structure, compels USNORTHCOM to compensate with heavy reliance on the four functional commands. JFCOM provides virtually all of its forces. USSOCOM assists with counter-terrorism operations. USSTRATCOM partners in defensive information operations,

communications, space support, and missile defense tasks. However, for large-scale consequence management incidents, almost always requiring rapid mobility and logistics support, USTRANSCOM becomes the indispensable functional supporting command.

Federal Interagency Coalition Concept

The role of USNORTHCOM is difficult to grasp without understanding its role as the military component, or *DoD LFA* piece of the larger national homeland security puzzle. The unique LFA-centric structure of the Federal NRP might best be understood in terms of an interdepartmental coalition operation. Since non-DoD actors cannot be integrated into a true unified command model (in the Title 10 military sense), and given that these operations are predicated upon unity of common effort, a coalition is an accurate description of the myriad of independent federal agencies that are involved in major national emergency response operations. Similar to sovereign nations of varying sizes and capabilities, the numerous federal departments, states, and local agencies are intensely *territorial* about guarding their independent equities and identities, even at the expense of the common objectives of the rest. Yet, all are clearly stakeholders in the same homeland security coalition effort. Moreover, all departments publicly agree that, to be effective, efforts must be coordinated. The DoD might have the hardest time coming to grips with being part of a coalition it does not lead or control.

Therefore, the coalition model can be a useful template for analyzing the federal homeland security *war effort* as it were. The President's own HSPD-5 states, "The objective of the United States Government is to ensure that all levels of government across the Nation have the capability to work efficiently and effectively together, using a national approach to domestic incident management ... to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity."⁵⁸

Putting policy on paper provides only a vision and its intent. Actually executing interagency planning and coordination within the largest and most complex bureaucracy in world history is a bit more of a challenge. According to author Arthur Rice, three elements are essential to coalition success—a lead nation, unity of command, and staff integration.⁵⁹ The following macroanalysis applies these three elements to the US civil-military *homeland coalition*.

First, the role of *lead nation* must be bestowed on the DHS, since it is the ultimate LFA with the assignment of coordinating "the Federal Government's resources utilized in response to or recovery from" incidents of national significance.⁶⁰ Therefore, only DHS can rightfully assume this role, especially in purely disaster and catastrophic humanitarian relief scenarios. All agencies agree that a surprise, multifaceted event involving critical infrastructure and multiple population centers could occur at any time. Yet the chaos-producing events in New Orleans in 2005 were relatively forgiving in that they were driven by a benign natural enemy and not by a determined and deliberately malicious terrorist organization. If it had been the latter, the careful legal distinctions surrounding what constitutes a DoD-led homeland defense scenario versus a DHS-led civil support scenario could have easily become blurred. In such dire cases, the President will be the ultimate arbiter of categorizing the crisis and assigning an LFA. The two clearly dominant departments—

DoD and DHS—will have to provide mutual support. However, The President’s HSPD-5 lays out policy direction, but defaulted to the Secretaries of Defense and Homeland Security to “establish appropriate relationships and mechanisms for cooperation and coordination between their two departments.”⁶¹ Although both have technically complied, the less-than-stellar response to Hurricane Katrina, and the extremely negative political fallout has both departments, DoD and DHS, reevaluating all cross-coordination and response mechanisms.⁶²

The second essential element of coalition success is unity of command. The departments of the US government are technically parts of a centralized federal government. However, the departments work more as a loose confederation than a strongly centralized federalist government.⁶³ To use the US Civil War as the leading example, a major limitation to the Confederate government’s war effort was lack of authority to supersede states rights—insurmountable since it was the root cause of their rebellion. While the Union centrally resourced, planned, and executed under a true unified command structure, the most the Confederacy could do was coordinate efforts for *the cause*. For example, the states could not even be compelled to share uniforms or weapons. State forces cooperated with each other and provided mutual support only on a voluntary basis. The authority granted the Secretary of the DHS by the Homeland Security Act of 2002, and echoed in HSPD-5 makes DHS responsible for *coordinating* federal operations, not controlling them per se.⁶⁴ While the Secretary of DHS is certainly not the equivalent of Jefferson Davis, his problems are very much similar in dealing with other interagency actors which include the 50 US state governors who also must be included as independent executives and homeland security coalition *partners*. Federal unity of command is missing and unity of effort is based on a DHS-led confederated architecture. This is the homeland security coalition’s Achilles Heel.

The third essential in Rice’s coalition model is staff integration. Of the three, this is the most promising to emphasize given the number and complexities of the federal departments and agencies. Interagency information sharing and cross-intelligence will be crucial in managing complex crisis action responses. To formally facilitate this, all combatant commanders, including USNORTHCOM, have created permanently assigned Joint interagency coordination groups (JIACGs) which include experts and liaison officers from other commands, various departments, and state and local authorities. These are supposed to form a “critical bridge between the combatant commander and the appropriate LFA as required.”⁶⁵ However, exchanging liaisons is not integration of operations. Moreover, the proliferation of command centers within every major department makes it almost impossible to maintain liaison connectivity with every one, and vice versa.

Further, the military paradigm of tactical level tied to operational control, tied to strategic objectives means little to local agencies. Moreover, since incidents of national significance happen only rarely, local, and even federal entities, are willing to wait until an event is underway before devoting the type of planning and training resources that should be required for each ESF scenario. For example, there is no strategic fire chief who can order the training and equipping of hundreds of thousands of firefighters in tens of thousands of localities. Furthermore, even though all US first responders are technically at the *tactical level*,

as are DoD forces, they are not beholden to any form of centralized doctrine or a layered C3 system per se. The NIMS is the best attempt to connect C3 in crisis response, but its utility does not directly extend to steady-state planning and coordination efforts. Integration for cooperative and collaborative efforts is better than nothing, but it is far less efficient than strong centralized planning and C3.

The challenges for the DHS Secretary and the inherent difficulties in the DHS system became readily apparent in August 2005 when a catastrophic hurricane devastated the Gulf Coast region of the United States. The ensuing federal response became an excellent case study for all aspects of the federal *coalitional* mechanisms established since 9/11. The following chapter analyzes that domestic hurricane relief effort to identify organizational and logistical challenges and compare these challenges to the international tsunami relief effort of 2004.

Humanitarian Relief Operations

It was the largest natural disaster ever to strike the United States—92,000 square miles. Logistics were falling apart.... I should have asked for the military sooner. I should have demanded the military sooner.

—(Former) FEMA Director Michael Brown,
18 January 2006

Hurricane Katrina

The DHS pressed the previously untested NRP into action on 29 August 2005 when a natural event of immense proportion struck the Gulf Coast. In the latter part of August, a hurricane developed in the Caribbean, cut across southern Florida, and moved northwest into the Gulf of Mexico.⁶⁶ The hurricane, named Katrina, intensified, tracked northward and made landfall in the Gulf Coast regions of Louisiana, Mississippi and Alabama. At its peak, the storm developed into a category five event on the Saffir-Simpson scale.⁶⁷ At landfall, it was a category four hurricane with winds of 140 miles per hour.⁶⁸ The devastation from the storm was beyond any level anticipated. Thousands of Gulf Coast residents across the three states were in dire need of assistance.

In anticipation of the impending relief effort, USNORTHCOM began to position liaison elements well before requests for assistance from any of the states reached the federal level. USNORTHCOM began coordinating with USTRANSCOM, FEMA, and the states a full five days prior. On 24 August, USNORTHCOM sent warning orders to regional and state emergency preparedness officers and the states’ senior Army guard advisors.⁶⁹ On 28 August, USNORTHCOM positioned a USTRANSCOM liaison officer inside its headquarters.⁷⁰ Given that the destructive scale of Hurricane Katrina was yet unknown, these steps were reasonable.

It was not until the Hurricane was actually moving inland that DHS requested DoD assistance per formal NRP process channels. In response, USNORTHCOM established JTF Katrina, a contingency JTF construct built from elements of the command’s standing JTF Headquarters North, JTF North, and JTF Civil Support. However, USNORTHCOM chose to deviate from its expected composition by tasking 1st Army at Fort Gillem, Georgia as lead unit, instead of 5th Army at Fort Sam Houston,

Texas, which had been predesignated for the homeland security support mission.

Over the next 7 days staging operations were established at Maxwell Air Force Base, Alabama; Keesler Air Force Base, Mississippi; Barksdale Air Force Base, Louisiana; Naval Air Station Meridian, Mississippi; Alexandria, Louisiana; Fort Polk, Louisiana; and New Orleans International airport. C3 operations were established at the USNORTHCOM JOC located at Peterson Air Force Base, Colorado; Fort Gillem, Georgia (JTF Katrina Headquarters); Camp Shelby, Mississippi (JTF Katrina forward); Baton Rouge (JTF Katrina Southern Louisiana) and aboard the USS Iwo Jima (a second JTF Katrina forward), with an air expeditionary task force (1st AETF) at the Air Operations Center (AOC) located at Tyndall Air Force Base Florida.⁷¹

The USNORTHCOM-appointed JFACC, Major General M. Scott Mayes, led JTF Katrina air component operations through the Tyndall AOC. General Mayes, a veteran fighter pilot, was commander 1st Air Force, and commander Continental North American Aerospace Defense Command Region. He was also the JFACC for Operation Noble Eagle, responsible for contingency planning and aerospace defense of the continental United States.⁷² However, doctrinally the JTF commander selects the JFACC based on the overall mission, concept of operations, the missions and tasks assigned to subordinate commanders, forces available, duration and nature of the operation, and the degree of unity of command required.⁷³ With JTF Katrina, the clear

supporting air defense, air sovereignty, air battle management, radar warning, fighter patrol, and aerial tanker operations.⁷⁴ While the standing AOC structure presented a logical C3 center for the JTF Katrina air component, the internal structures and capabilities for support of a humanitarian-type civil support operation were questionable. As a standing AOC, Tyndall has the five standard divisions: strategy, combat operations, combat plans, air mobility (AMD), and intelligence, surveillance, and reconnaissance (ISR). However, unlike AOCs in Korea, Europe, or USCENTCOM, the USNORTHCOM AOC divisions are oriented almost entirely toward the air defense mission, but poorly manned for a major deployment and distribution mission.⁷⁵

To be sure, JTF-Katrina's complex air operations went beyond mobility, but air sovereignty fighter missions were not part of the mission set. The overall air component mission was fourfold—ISR, search and rescue, airspace control, and humanitarian relief operations which were comprised of airlift and aeromedical evacuation missions. The ISR mission was minimal, amounting to one sensor-equipped aircraft that flew less than five times in support of JTF-Katrina. Search and rescue operations were controlled by the Joint Personnel Recovery Center collocated with the AOC at Tyndall AFB.⁷⁶ This organization operated parallel and in coordination with the AOC.

Airspace control proved to be a larger challenge due to Federal Aviation Administration (FAA) jurisdiction and the sheer

The organized chaos highlights that requisite coordination, let alone command and control, was never truly attained. Given the disparate organizations employed, one must question if an adequate command and control structure is even feasible under the current response agreements, given the number of *federal coalition* actors. It is, however, apparent that a viable command and control architecture must exist across the span of the DoD responders.

preponderance of fixed-wing forces were from the mobility air forces (MAF), as was the C3 architecture inherent at the Tanker Airlift Control Center (TACC) and the Global Patient Movements Requirements Center (GPMRC). These factors would have made the 18th Air Force commander, as the MAF's numbered Air Force *warfighting* commander, the most logical candidate for the JTF/JFACC position. Another logical choice would have been a senior ranking helicopter search and rescue airman, from any service including the US Coast Guard. While either of these options would have been a viable solution, USNORTHCOM felt it was more appropriate to use its organic air component commander, and his *inhouse* AOC capability to manage operations.

Under normal conditions the Tyndall AOC operates as the NORAD Southeast Air Defense Sector for Operation Noble Eagle,

amount of rotary wing assets operating in the recovery area and outside the AOC Air Tasking Order System. The AOC did produce an airspace control plan, however based on reported conflicts, it is doubtful that all military aircraft adhered to the plan. The potential for a mid-air collision operating under a *see-and-avoid* type system requires further research to define responsibilities and mandatory coordination between the FAA and the AOC.

In the final analysis, with virtually independent airlift, aeromedical and search and rescue operations underway throughout the Katrina AOR, the interceptor-centric AOC's Air Tasking Order amounted to controlling the three special use platforms that were under the tactical control of the JFACC—the Scathe View imaging system, the aerial spraying system, and the airborne firefighting system. All of these assets completed

negligible sorties in comparison to the scope of the aerial relief missions.

On 29 August, 18th Air Force designated Colonel John Gomez as the Director of Mobility Forces (DIRMOBFOR) in support of the aerial relief effort. Later, as the scope of the catastrophe expanded, Brigadier General Mark Zamzow plus two deputy DIRMOBFORs were brought in to help coordinate tasking and validation of airlift and aeromedical missions with USTRANSCOM and the 18AF/AOC, also known as the TACC, at Scott Air Force Base, Illinois.⁷⁷ This adjustment reflected not only the change in scale of the emergency, but the major role the DIRMOBFOR would fulfill as the mobility expert in advising the JFACC and directing the actions of his Air Mobility Division (AMD).

The Tyndall AOC's AMD was heavily weighted toward air refueling experts necessary for the AOCs primary fighter-centric NORAD mission, at the expense of operational airlift expertise. This required substantial augmentation of the AMD via deployment of seven airlift specialists from USTRANSCOM. Humanitarian relief operations, specifically airlift support, were coordinated through the AMD to the TACC using a *reachback* concept for tasking and coordination essentially independent of the AOC's Air Tasking Order.⁷⁸ Aeromedical evacuation operations were managed in a similar fashion through the Global Patient Movement Requirements Center (GPMRC) at USTRANSCOM.⁷⁹

Requests for assistance from various federal agencies and nongovernmental organizations were validated through USNORTHCOM's Deployment and Distribution Center (NDDOC) at Fort Gillem in coordination with the USNORTHCOM Joint Operations Center/J4. Valid requests were forwarded to the USTRANSCOM DDOC for DoD priority, validation and modal determination. Perhaps most importantly, the *big picture* operational mobility management was performed at USTRANSCOM headquarters DDOC, rather than the USNORTHCOM AOR's NDDOC. Requests from USNORTHCOM were collated and stacked against other worldwide DoD priorities. After USTRANSCOM added their validation stamp to requested movements, it translated them into missions for its component elements in the most efficient and effective way possible—specifically 18th Air Force, the Surface Deployment and Distribution Command, and the Military Sealift Command.

It is noteworthy that the USNORTHCOM validation and tasking process took 5 days to establish as the center was forward located and the command does not normally operate a Deployment and Distribution Center.⁸⁰ Moreover, both the USNORTHCOM DDOC and the AOC/AMD at Tyndall were stood up by deploying primarily USTRANSCOM-assigned personnel. Thus, on paper USNORTHCOM provided the operational and *tactical relief* C3, when in actuality it did not have the organic capability to do so. By contrast, the TACC, which normally manages dozens of airlift missions worldwide at any given moment, every day of the year, performed those same C3 duties for airlift missions in support of JTF Katrina in normal stride.

On the ground inside the JTF AOR there were tandem operations. As the magnitude of the crisis became clear, USTRANSCOM coordinated with USNORTHCOM to allow the rapid deployment of its AMC Contingency Response Group

(CRG) Elements and Tanker Airlift Control Elements (TALCEs) to establish major aerial ports at Keesler Air Force Base, Mississippi; Jackson International Airport, Mississippi; New Orleans International Airport, Louisiana; Pensacola Naval Air Station and Duke Field, Florida. Each of these elements is specialized in *airfield opening*, or standing up the prerequisite air mobility enabling functions of airfield operations, C3, and aerial port capabilities—all essentials for the reception and handling of inbound platforms, their cargoes, deploying forces, and so forth. Moreover, these elements are arguably the single most critical piece of any airlift operation since they modulate throughput and efficiency inside the disaster relief zone itself. Furthermore, these units are trained, manned, and equipped for short-notice response to austere environments, which means they are essentially tailor-made for reestablishing access to catastrophically-impacted areas—even if those are in the CONUS. Based in California and New Jersey, and maintaining a 12-hour alert-to-launch window, these assets can be rushed to any point in the 50 states well within 24 hours.

These professional mobility experts were, without question, the right teams inserted at the right locations. However, they were the final delivery destinations of the USTRANSCOM system. Therefore, at these same locations, the JFACC established air expeditionary groups (AEGs) to act as functional air bases for the JTF. Reports indicate the USNORTHCOM CRG/TALCEs and AEGs cooperated well; however, they maintained separate command and control lines, presenting obvious challenges for deconfliction and unity of command. The salient point is that the aerial ports were where USTRANSCOM's job technically ended and the USNORTHCOM/JTF-Katrina (or DHS) responsibilities began, in terms of onward movement and distribution of the relief personnel and cargo delivered. Therefore, the span of control of the two major DoD stakeholders was marked out at the boundary between the operational level (USTRANSCOM) and the tactical level (USNORTHCOM).

Unfortunately, USTRANSCOM's controlled and deliberate mobility processes were pitted against a plethora of *coalition partners* external to the official JTF. No less than seven organizations were attempting to respond simultaneously, not always in parallel, or even coordinated.⁸¹ Alongside USNORTHCOM, other DoD, FEMA, state, National Guard, nongovernmental organizations, and private organizations all strived to provide relief as quickly as possible. Unscheduled aircraft began arriving at the relief distribution operations, including various state National Guard actors whose air mobility assets (primarily C-130s) were never formally assigned to the USNORTHCOM or USTRANSCOM. Furthermore, Navy, Army, and Marine Corps fixed-wing assets were not managed by the JTF, since they were *organic* service lift assets. Consequently, the JFACC had no control and very little visibility over these aircraft.⁸² Chaotic conditions are as counterproductive in relief operations as they are in war zones. Airfields and ramp space were always at a premium. Finally, the lack of centralized C2 created confusing and potentially dangerous situations for all involved. Scheduling, preventing bottlenecks, and ensuring throughput of lift assets was the goal.

All of the complicating unity of command and unity of effort issues resulted in a far less than optimized logistical operation. Situation reports had multiple examples of poor coordination. At Keesler Air Force Base, "lack of a single point of [overall]

scheduling caused airlift operations to slow considerably.” At New Orleans International Airport, “intransit visibility of cargo was nonexistent; unmarked pallets were offloaded [and] ownership was unobtainable.”⁸³

The organized chaos highlights that requisite coordination, let alone command and control, was never truly attained. Given the disparate organizations employed, one must question if an adequate command and control structure is even feasible under the current response agreements, given the number of *federal coalition* actors. It is, however, apparent that a viable command and control architecture must exist across the span of the DoD responders. And this structure should maximize existing capabilities and capitalize on dedicated expertise from the tactical through operational levels. If nothing else, clearly in this first major *real world* test, both DHS and USNORTHCOM proved they were ill-prepared to effectively manage wide-area logistics with organic capabilities in a large-scale domestic catastrophe. Certainly it underscored their reliance on USTRANSCOM’s core competency expertise, assets, and C3 architecture.

Indian Ocean Tsunami

The similarities of interagency and coalition operations in the Indian Ocean tsunami of 2004 and Hurricane Katrina 2005 are striking. According to the Operation Unified Assistance after actions report, 16 countries and no less than 200 nongovernmental organizations were involved in the international relief operation, operating from multiple countries. Indonesia hosted 68 nongovernment organizations, Thailand 35, Sri Lanka 84, and the Maldives 17. The greatest challenges to overcome were communication and, more importantly, command and control.”⁸⁴

The intensive helicopter-centric operations of JTF-Katrina in the United States were mirrored and exaggerated by the severe lack of ground infrastructure in the far-flung Indian Ocean. The fixed-wing airlift operation was equally as complex. US C-5 and C-17 heavy-airlift aircraft were flown into Utaaphao, Thailand, making it the strategic distribution hub. From there, C-130 tactical airlift aircraft from a variety of countries and Service components, 19 suboperations in total, delivered relief supplies to forward locations in Sri Lanka, Indonesia, and Thailand. From those forward operating locations, helicopters, the critical key to successful distribution operations, were used to take supplies in, and refugees out of remote disaster areas.⁸⁵ The DoD air component commander’s concept of operations was a classic strategic logistical management example of hub and spoke operations. While this type of operation is simple in concept, the supporting C3 architecture is not. The US military, specifically USTRANSCOM, has the equipment, communications, and most importantly, the expertise to organize on such a scale. The hundreds of nations and nongovernment organizations that plugged into this US-facilitated system and the victims were the beneficiaries. The alternative would likely have been haphazard in execution and lethally slow in effect.

Of special note, the US military-led coalition originally formed a JTF, however the political implications of a perspective US-dominated C2 structure led to the re-designation of the operation under the guise of *combined support forces*.⁸⁶ This structure may forecast the future of international coalition relief operations. It may also be a blueprint for domestic operations given the “coalition” of interagency, active duty, state, local and

National Guard operators—especially to effectively coordinate the myriad ground, helicopter, and light fixed-wing relief actors.

Since the operation was multinational and ad hoc, there was ineffective cargo validation and prioritization management, at least in the first critical weeks of the relief operation. After-actions reporting by the JFACC, Major General Deptula, is telling:

[Relief requirements] assumptions and reality clashed as we all struggled to identify requirements. Initially there was a big push to deliver as much water, food, clothing, plastic, and sheeting, into theater as we could cram onto available aircraft. As the operation progressed and we started to see piled supplies, the requirements definition became critical. Since the US Agency for International Development was the lead organization there was an assumption that they would take the lead, and maybe they did ... but the translation of those needs to the JFACC was slow and at times nonexistent.⁸⁷

The associated lessons learned observation made by USPACOM is virtually identical for Katrina operations. It stated there was a need to quickly establish a robust requirements and validation process, based on a common doctrine to ensure the proper flow of cargo requests for airlift. There are also critical needs for a 24 hour, 7 day continuous response capability and for personnel experienced in the requirements process.⁸⁸ In every major mobility support operation the essential information is “what, where, how much, and how fast.” Requirements absolutely drive the size and scope of the transportation response. However, without this type of accurate and timely data flow from the LFA, the supporting operations, even if led by DoD, are doomed to produce chaos.

Summary, Conclusions and Recommendations

This article started with the Presidential directives and legal underpinnings most important to DoD support of civilian and military authorities. Second, it laid out the national-level solution of federal reorganization designed to foster close coordination. It explained the NRP and NIMS graduated incident response structure within which DoD support is expected to function. In order to explain the limitations on forming civil-military cooperative command arrangements, it touched upon the fundamental differences of the principles of unity of effort and unity of command. Next, the article explained the purpose and structure of the UCP in order to enable the reader to understand specifically the military’s worldwide organizational architecture and USNORTHCOM and USTRANSCOM’s respective positions inside it.

The history of the UCP reveals three key observations. First, the DoD has historically only organized to perform the minimum essential operations required of it both in the military homeland defense and civil-support homeland security missions, a luxury no longer affordable. The DoD must be a full partner in proactively supporting DHS and other government agencies in anticipation of, rather than purely in response to, incidents of national significance. Second, the UCP history reveals that subarchitectures can be reformed any time there is an operational necessity to do so. Finally, the accepted divisions in the offensive and defensive C3 architectures confirm that the single unified commander for the North American AOR does not have to be in control of every traditional mission facet assigned to geographical AOR commanders.

The authors have reached three overarching conclusions based on the above analysis. First, there is a demarcation of two concentric logistics and mobility missions. The first can be thought of as *tactical relief* operations inside the JTF JOA, which includes distribution of relief cargo and services. Both the USNORTHCOM AOR Katrina and the PACOM AOR tsunami relief efforts depended largely on US and *coalition* partners at the tactical level. These forces provided boots on the ground and especially rotor-wing rescue and lift assets which are arguably the most vital assets of all that military capabilities bring to bear in such a crisis. The second is the intratheater, or what can be thought of as the *operational and strategic movement* via common user, DoD airlift and other mobility assets.

Second, this article concludes that the USNORTHCOM AOR, in both the Homeland defense and Homeland security support mission realms, has a requirement for operational and strategic logistics and mobility management. These functions are within the purview of USTRANSCOM. The need not be replicated by USNORTHCOM because they are already resident at USTRANSCOM.

USTRANSCOM's functional core competency mission makes it the only DoD entity capable of strategic logistics management—not only in the sense that its worldwide mobility capabilities are an instrument of national power, but also in the literal sense of using an expert strategy to gain maximum efficiency and effectiveness from the supply chain. The US Council of Logistics Management defines strategic logistics management as:

The process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements.⁸⁹

In this case, the customers can be defined as either the end users that DoD is trying to supply (like hurricane victims), or to the LFA or DoD command being supported itself—either way the definition fits. The salient point is that USTRANSCOM is the only *federal agency* that can perform the above functions on a grand scale.

According to Joint Publication (JP) 3-26 *Homeland Security*, USTRANSCOM “provides common user and commercial air, land, and sea transportation, common user port management and terminal services ... to [USNORTHCOM] and [PACOM] within their respective AORs for homeland defense and civil support mission areas.”⁹⁰ In addition to this charter to support the two commands whose AORs contain all 50 US states, JP 3-26 also says that USTRANSCOM will do the same for lead federal agencies directly when ordered by the President or Secretary of Defense. Therefore, depending on the situation, LFAs may be directly supported by USTRANSCOM, or they may use USNORTHCOM or PACOM as a DoD intermediary.

USTRANSCOM also provides worldwide patient movement and evacuation, and it now serves as the DoD distribution process owner responsible for the execution of the strategic distribution system.⁹¹ In this last capacity, the command has moved beyond merely transporting personnel and cargo from point to point. USTRANSCOM is now attempting to mirror civilian supply chain management and distribution processes. Its command headquarters, central DDOC, is populated with staff from its Army, Navy and Air Force components which process DoD

transportation requests by validating, prioritizing, and choosing the transportation mode given the requirements. Furthermore, USTRANSCOM has unique and distinctive capabilities that need very few layers of bureaucracy to accomplish the effects required. In fact every layer added actually slows down the response unless there is value added in the form of efficiency for the wider effort. For a given movement, say armor for vehicles to USCENTCOM or humanitarian relief supplies to USNORTHCOM, waiting for an opportunity to *bundle* larger aggregates of supplies are examples of overall value-added efficiency delays. On the other hand, simply waiting for another layer of DoD or civilian bureaucracy to rubber stamp an approval is nonvalue added.

In strategic logistics, efficiency equates to effectiveness. This premise is deceptively simple to agree with but much harder to actually orchestrate. At the tactical level each independent operator considers their load of materials *top priority*. The Katrina DIRMFOR noted the effectiveness and timeliness of airlift requests “were hampered by the fact that few agencies outside of USTRANSCOM and AMC truly understood distribution processes.”⁹²

The USNORTHCOM headquarters, by contrast, has a relatively small logistics planning staff by geographic command standards. Day-to-day, it directs its execution through a collocated Joint operations center. In times of crisis in its AOR involving large-scale mobility operations, the command will partner with USTRANSCOM to stand up its own “USNORTHCOM DDOC,” or NDDOC, which is essentially a forward deployable DDOC performing a similar function as USTRANSCOM's but on an AOR- or JTF-confined scale. Moreover the NDDOC's operational chain of command runs up to USNORTHCOM, while most of its practical coordination is with USTRANSCOM. Therefore, the overall NDDOC coordination process owner is technically USNORTHCOM, but the de facto process owner, given its worldwide constant C3 of the entire DoD system, is clearly USTRANSCOM.⁹³

The third conclusion is that, for incidents of national significance, operational and strategic logistics planning cannot wait until requests are made by overwhelmed LFAs. The rationale for developing the DHS and USNORTHCOM was to increase overall responsiveness to catastrophic events whether caused by an act of terrorism or an act of nature. Trying to do this effectively while in a reactionary mode from a national crisis is next to impossible. In hindsight, the operational response became a reverse engineering project where execution of the mission by USNORTHCOM developed ahead of an adequately robust support architecture.

It is clear that the federal government's lead umbrella organization, DHS, functions more on a coalition operational model that is closer to a *confederacy* than a federal *union*. Therefore, given the uniqueness of the AOR and the myriad agencies operating inside it, the requirement for USNORTHCOM to duplicate the USTRANSCOM functional architecture for large-scale contingency logistics and air mobility is obviated. Moreover, USTRANSCOM needs to be recognized as a discrete, full partner in the federal coalition, confined to its functional, core-competency as the single-point manager for transportation and logistics during large-scale *incidents of national significance*.

While the USNORTHCOM charter clearly defines roles for itself and USTRANSCOM, the limitations placed upon the civil support mission of *respond only when requested*, forces DoD,

and USTRANSCOM especially, to distort the distinctions between who is responsible for what, and when. It is the very nature of the response system that causes confusion and ultimately delays. Planning for in extremis response to incidents of national significance is the most critical missing component. While DoD assistance and resources can only be requested as a last resort for overwhelmed government agencies, *anticipatory*, DoD-guided planning coordination for those events need not be. Moreover, in military parlance, the CONUS is a very *mature theater*. Perhaps hardest to reconcile in terms of the rapid logistical response to Katrina is that there are so many obvious infrastructure advantages of the CONUS. Unlike remote parts of the Indian Ocean or central Africa, the United States enjoys the most robust transportation network on the planet. There is no physical impediment that cannot be overcome to ensure efficient end-to-end movement of relief supplies into, and evacuees out of a JOA like that of JTF-Katrina.

A systematic intermodal logistics chain and its C3 cannot be formed quickly enough to match crisis timelines in most cases. A second 9/11-scale incident or worse could happen at any time. However, while the NRP implores departments and commanders to lean forward in preparation, the current posture of *stand-by for official tasking* from the designated and overwhelmed LFA will guarantee a response system lag. Yet, a tear in the national fabric must be immediately treated via all federal coalition means available. The disaster response sensor-to-reaction mechanisms must be made more efficient. The Homeland Security and Homeland Defense stakeholders must be postured to provide a wide-area *organized* response to domestic catastrophe.

In Thomas Friedman's book *The World is Flat*, he uses UPS as the model corporation that takes the logistics piece over on behalf of less capable companies rather than have them *duplicate the process*.⁹⁴ USTRANSCOM is perfectly suited to fulfill this function. It de facto forms an all-modal reach-back for domestic incidents of national consequence with USNORTHCOM as the DoD primary C2-agent command.

Planning for rough requirements, pre-siting perspective airfields and cargo ramps, and likely logistics relief hubs and spokes in the USNORTHCOM AOR takes a predictive strategic logistics approach. FEMA certainly has the experience and expertise in defining the baseline relief requirements. These should be prepackaged and ready when a crisis occurs. However, to ensure this working relationship, USTRANSCOM cannot afford to rely on crisis action scenarios. It must devote a sizeable portion of its own expert planning resources to assist USNORTHCOM and the other coalition partners during the preplanning and preparedness phases. No other lead entity can accurately perform shaping functions on size, nature, scope and limitations of the logistics portion of a federal response. In practical terms USTRANSCOM, with its global support to all unified commands, can only afford to treat USNORTHCOM as one of its major warfighter customers. However, the USNORTHCOM/J4 logistics staff's *primary* role needs to be planning and exercising with USTRANSCOM.

The relationship between USNORTHCOM and USTRANSCOM should differ from relationships among the other geographic commanders. Both commands, one functional and one geographic, must team with DHS to develop a more formalized and structured architecture for coordinating all federal, state and private airlift and mobility requirements for

relief support. This would entail mandating all responding agencies and organizations to coordinate their airlift needs or operations with a central clearinghouse for deconfliction. This will tie the USNORTHCOM JTF tactical end-user distribution piece with USTRANSCOM's strategic logistical capabilities piece. The latter should be considered a full partner in the federal coalition for exactly that function—its chartered unified command function defined in the UCP.

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Lieutenant Colonel James D. Hamilton, USAF, is currently the Director of Operations, 18th Air Force/618th Tanker Airlift Control Center, Scott Air Force Base, Illinois. At the time of the writing of this article, Lieutenant Colonel Hamilton was a student at the Air War College, Air University, Maxwell Air Force Base, Alabama.

Lieutenant Colonel Paul Murphy, USAF, is Deputy Chief, Global Mobility Division and Panel Chair, Global Mobility Panel, Headquarters Air Force, Washington, DC. Lieutenant Colonel Murphy is a command pilot with more than 3,100 hours in the KC-135A/R/T, T-37, and T-38. At the time of the writing of this article, he was a student at the Air War College, Air University, Maxwell Air Force Base, Alabama.



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Decision Framework for Dynamic Manpower Reallocation

Lieutenant Colonel Brent French, USAFR
 Lieutenant Colonel Steven Kauffmann, USAF

Introduction

As the Air Force continues to play a dominant role in the Global War on Terrorism, airmen worldwide are challenged with grueling schedules and longer duty hours. With some career fields and units tapped more heavily than others, leaders find themselves having to consider temporarily realigning resources to meet short- and long-term objectives. This article presents a systematic way to consider reallocation decisions and should be of interest to readers responsible for managing and leading units that contain shift workers. Presented below are comparative techniques to determine relative burden levels and conceptual triggers for augmenting distressed agencies.

Example

During her first month as a newly-assigned group commander, Colonel Smith was notified by one of her squadron commanders that an airman had dozed off while driving on the flightline and struck a parked airplane. The accident occurred during the last few hours of the airman’s shift and his last day before a two-day break. The squadron commander explained that his unit had been working 12-hour shifts for the past 3 months, and was planning to continue the schedule into the foreseeable future. The squadron is working a 4 days on and 2 days off cycle, and this is the third mishap attributable to long duty hours. Colonel Smith wonders if she can temporarily reallocate manpower from some of her other squadrons to get the unit back into 8-hour shifts. She knows that her other squadrons are working 10-hour days, 5 days a week. She is having difficulty comparing each unit’s *level of effort*

because of the dissimilar duty hours and duty cycles. Even if one of her squadrons were underutilized, would it make sense to reallocate manpower?

Discussion

As the Air Force evolves to meet the increasing demands of a post-9/11 environment, leaders will continue to be challenged by manpower allocation decisions. Many competent managers are forced to rely on intuitive techniques without a systematic way to frame the issues surrounding augmentation. The purpose of this article is to present a framework that helps military commanders make dynamic resource allocation decisions that ultimately contribute to short term mission accomplishment and long-term organizational well-being. Grounded in the academic disciplines of operations management and decision analysis, this decision framework consists of two dimensions—a *utilization factor* and a *utility function*. The utilization factor is used to develop a burden index, useful in comparative analysis and answering the question, “Are some of my units working disproportionately longer hours than others?” The utility function then provides the commander the tools to decide, “Should I temporarily augment an overused unit with manpower from an underused unit?”

Utilization Calculations

Utilization calculations are fundamental to understanding various output rates across units with dissimilar resources and duty requirements. We have identified three input variables that influence the output rate—*manpower available*, the *situation*, and the *schedule*. The first input defines the number of personnel present for duty (PFD). An alternative input could be using the number of personnel assigned, but this figure tends to mask the reality of manning situation. The second variable, *situation*, helps commanders account for the context of the decision and for our purposes, is limited to three categories—contingency, surge, and normal. *Contingencies* include environments that require higher utilization rates without the penalties and full implications associated with normal operations. *Surge* accounts for a temporary increase in required output—examples include a change in aircraft alert posture or increased threat conditions.

Article Acronyms

- D - Duration
- MI - Mission Impact
- PFD - Present for Duty
- R_L - Risk Leveling
- R_{NL} - Risk Not Leveling
- TB - Transition Burden

Normal is defined as routine operations and is typical of many permanent bases. The third variable is *schedule*, and has significant bearing on utilization. The schedule has four dimensions—*duration*, *days on*, *days off*, and *setup time*. *Duration* includes breaks and meals and is usually expressed in hours. *Days_{on}* and *Days_{off}* are then converted to *Cycles per Time Period* for normalization. *Time Period* is the length of the analysis period. In this article, we use a 28-day time period. *Setup time* needs to be considered to create an accurate picture of the complete duty day. For aircrew, the duty day often begins with reporting in for a premission brief, followed by a mission brief, aircraft departure and return, equipment turn-in, and debrief. Twelve hours of flying easily translates to a duty day of 16 hours when setup time is included. In another example, an immunization technician may have customer hours of 0700-1500. His customer facing time is 8 hours, but he has to arrive at work 30 minutes prior to set up the crash cart, unlock cabinets, prepare certain types of shots, power on computers, and so forth. At the end of the day he has to spend 30 minutes doing the reverse. The distinction between *customer facing time* and *duty time* is important in understanding different burden levels across units—we call these *Output_{customer}* and *Output_{duty time}* respectively.

Before leaving the burden index, a discussion of mission required activities not related to customer output or setup time is warranted. Airmen are required to attend to a variety of training events and personal appointments related to deployment readiness. Career field specific training also occurs outside of customer facing activity. For example, an air traffic controller cannot leave her post to attend a dental appointment. She has little flexibility relative to other airmen who can leave their duty station without substantial negative customer service impairment. The amount of flexibility to attend required events

away from the place of work is a matter of degrees. To simplify the issue and incorporate it into the burden index model, we have to classify units as *flexible*, *constrained*, or *inflexible*. A *flexible* unit can conduct training and allow people to meet personal readiness appointments with minimal impact to the customers they service. A *constrained* unit has the ability to let people leave the duty section but with some type impairment to customer service—customers may have to wait in line for 10 minutes rather than 5 minutes. An *inflexible* unit is one in which people can only attend training events or appointments outside of normal customer facing time. Squadrons generally have a mix along this scale. Management in the *back office* may be flexible, but airmen facing customers may be either constrained or inflexible. The category a unit falls into is subjective, but the overall classification should reflect the overwhelming majority of unit personnel. To quantify this concept, we have weighted each category and used the weight as a multiplier to the index. To go further than this simple method would encroach on manpower authorization and manning standard multipliers—out of scope for our proposed decision tool. If people in a unit are faced with tough schedules and cannot leave the duty section to attend appointments, the burden is higher and augmentation is desirable.

Figure 1 provides baseline utilization rates given 100 people present for duty (PFD) for contingency, surge, and normal and provides examples of different units and their burden indices. Note that the *normal* situation tends to describe a Monday through Friday work schedule where people report at 0700 and leave at 1600. Normal shows a utilization of 46 percent—that is 46 percent of the people working 7 days a week, 8 hours a day, with an hour of setup in the morning and an hour of setup in the evening. The 7 day a week scenario is a maximum output rate

Unit Name	PFD	Situation	Schedule Definition(hrs)	Days On Days Off	Cycles per TP	Output Customer (hours)	Setup (hours)	Output Duty (hours)	Maximum (PFD * 7/0/12/2)	"Degree of Flexibility"	Utilization	Burden Index
BASELINE	100	Max	12	7 0	4.00	33,600	2	39,200	39,200	Inflexible	100%	100
	100	Contingency	12	6 1	4.00	28,800	2	33,600	39,200	Inflexible	86%	84
	100	Normal	8	5 2	4.00	16,000	1	18,000	39,200	Inflexible	46%	2
Sqn A	25		12	5 2	4.00	6,000	0	6,000	9,800	Inflexible	61%	18
Sqn A	25		8	5 2	4.00	4,000	0	4,000	9,800	Constrained	41%	0.375
Sqn A	25		8	5 2	4.00	4,000	0	4,000	9,800	Flexible	41%	0.25
Sqn B	72		8	5 2	4.00	11,520	2.5	15,120	28,224	Constrained	54%	6
Sqn C	321		12	6 3	3.11	71,904	2	83,888	125,832	Inflexible	67%	28
Sqn D	268		12	1 1	14.00	45,024	4	60,032	105,056	Flexible	57%	6
Sqn E	111		10	6 1	4.00	26,640	4	37,296	43,512	Inflexible	86%	80

Figure 1. Output and Utilization Rates for Various Schedules

and can only be sustained for very limited durations. It serves as an uppermost limit of output. The burden index for normal is a 2. The index number is nonlinear—the closer the utilization rate approaches 100 percent, the higher the index number (achieved by squaring difference between the utilization rate minus a minimum utilization level of 40 percent). The longer hours worked and the shorter the recovery time, the greater the burden.

The indices and $Output_{Duty}$ can be graphically depicted for comparison and are plotted in Figure 2. When a unit's schedule falls within the area shaded in dark gray, leaders should consider a temporary reallocation. This figure was developed by holding the number of personnel assigned and the degree of flexibility constant (*inflexible* in this case) across ten popular scheduling options. Further, we constructed an array (model) of 10 different on/off day combinations and 6 different shift durations (8-hour shifts with no setup all the way up to 12-hour shifts with 2 hours of setup) and plugged in the variables into a table similar to Figure 1 to determine the 60 possible indices. Figure 2 yields several interesting observations. First, according to the model, a 4 and 2 has the same burden level as a 6 and 3 schedule. This occurs because the ratio of time on to time off is the same for both shifts. Second, leaders can more readily weigh the merits of different schedules—4 and 2 12-hour shifts fall within the same burden range as certain 8-hour shifts. The final and most important benefit of this type of graph is plotting actual data from various squadrons, seeing if some units are headed for trouble, and being prompted to consider reallocation.

Understanding that one unit is running closer to capacity than another is only one aspect of the reallocation decision. The next step in the process considers more subjective factors. Applying a utility function is the next step of the process and allows leaders to weigh the mission impact (MI) of their decision. MI has four components, expressed as $MI = (\text{risk}_{leveling}, \text{risk}_{not\ leveling}, \text{duration}, \text{and transition burden})$. $Risk_{leveling}$ (R_L) accounts for the opportunity cost of not having reallocated personnel performing their primary role because of a decision to level the overall burden of the group. For example, suppose you are a commander responsible for transportation and messing. You notice there is a

shortage of truck drivers (they are overutilized and working long shifts) and cooks appear to be underutilized. You are considering leveling the burden by tasking cooks to drive trucks, but having fewer cooks available for meal preparation could result in improperly prepared meals (a health risk) or longer wait times at the dining facility for customers. In this example R_L equals a decrease in food service and the probability of illness due to improperly prepared meals. If R_L is predisposed to quantification it should be quantified, but laborious measures should be avoided. R_L can be expressed and understood qualitatively. $Risk_{not\ leveling}$ (R_{NL}) accounts for the cost of not reallocating resources. To continue with our previous illustration, a shortage of truck drivers could have catastrophic effects if the group's primary mission is transportation. The shortage could also impact jobs that depend on trucking. For example, meal preparation is dependent on receiving timely food shipments delivered by trucks. Dependent and independent relationships between functions must be weighed, and the decision matrix allows for annotation of dependencies and hierarchical relationships. Reallocations are temporary for the scope of this framework and are defined as 5 to 180 days. Duration (D) of the assignment also influences the decision. If cooks only need to drive trucks for a 5-day surge period, the decision is appreciably different than tasking them to drive trucks for 6 months. The level of effort required to augment an overutilized function is the last decision variable and can be called the transition burden (TB). TB considers the level of training required, the periodicity of the training, the physical resources required to perform the task, and the retransition burden when the temporary duty is complete. Hypothetically, the TB of tasking a cook to drive a large truck includes an 8-hour truck driving class and a recertification class every 6 months that lasts 4 hours. Driving a truck requires no unusual resource requirements other than a truck. If the cook drives a truck for less than 90 days, he or she is not required to conduct recertification or training upon return to the mess hall. If it is greater than 90 days, he or she is required to be recertified on oven use, a 4-hour process. The TB of tasking a cook to backfill a loadmaster is an altogether different scenario—performing the

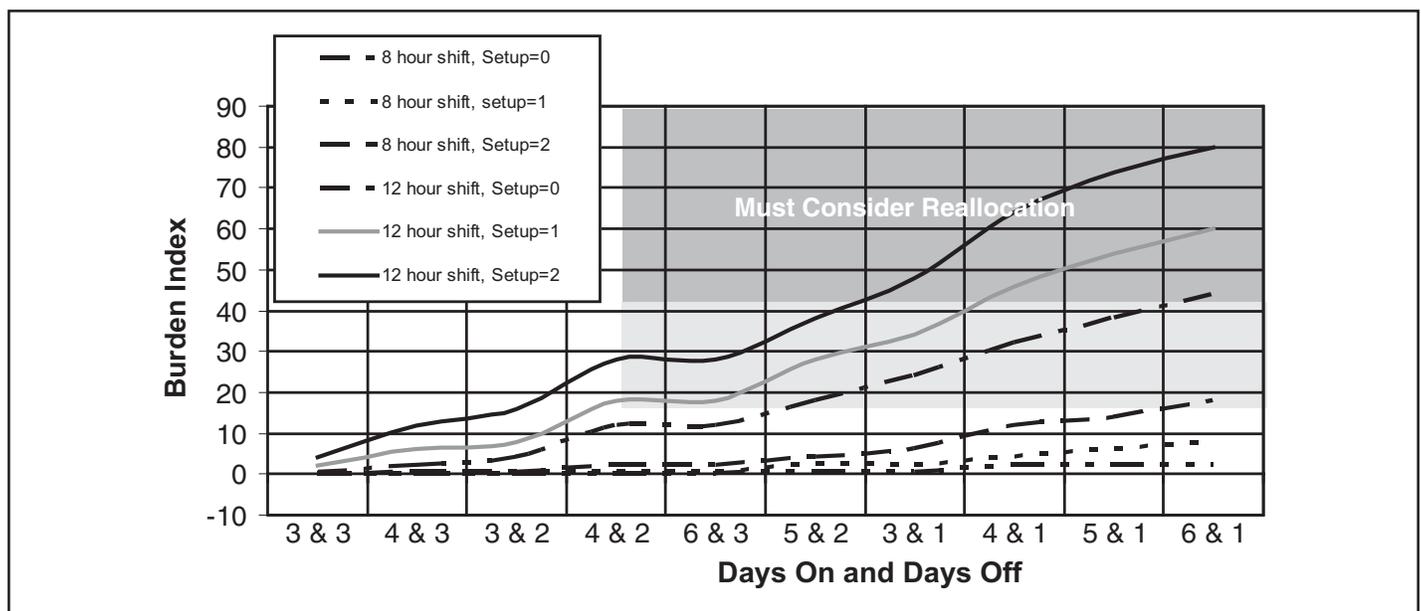


Figure 2. Plot of Relative Burden Indices

most basic loadmaster functions requires a significant amount of training. The rest of the TB calculation is irrelevant for a temporary reallocation decision. The TB of asking a cook to backfill security forces would require 24 hours of annual recurring training, and is gated by the resource requirements of a rifle and a radio. Each aspect of the TB should be analyzed for constraints that govern the utility function.

The overall decision framework can be graphically represented as is seen in Figure 3.

It is worth noting that this conceptual framework is unable to account for all the variables relevant to the decision. There are political considerations to be weighed, relevant aspects of unit history to consider, and anticipated burdens beyond the scope of the analysis time period that factor into the overall decision. Despite the shortcomings of this model, it should be an improvement on wholly intuitive models. With proper

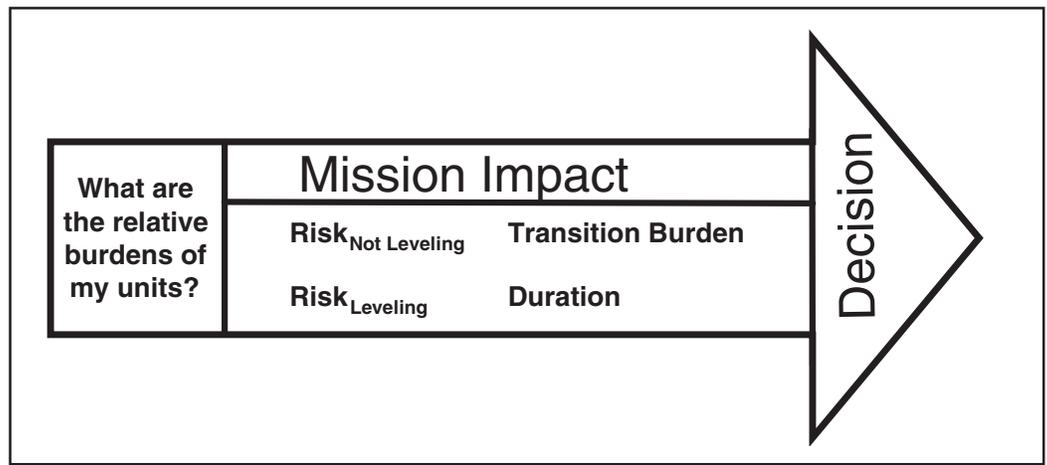


Figure 3. Decision Framework

application, leaders may be able to dynamically respond to upward trending manpower demands with better short- and long-term results.

Lieutenant Colonel Brent French is the individual mobilization augmentee to the Commander of the 6th Security Forces Squadron, MacDill AFB. He has a masters degree in Business Administration from Worcester Polytechnic Institute.



Historical Perspective

The battle is fought and decided by the quartermasters before the shooting begins.

—Field Marshal Erwin Rommel

No matter their nationality or specific service, military logisticians throughout history have understood the absolute truth represented in the above quote. Whether they were charged with supplying food for soldiers, fodder for horses or the sinews of modern war—petroleum, oil, and lubricants (POL), they have understood that victory is impossible without them—even if, sometimes, it seemed their vital contributions were forgotten or ignored. None of the great military captains of history were ignorant of logistics. From Frederick the Great to Napoleon to Patton, they all understood the link between their operations and logistics. The great captains also have all understood that history had much to teach them about the nature of the military profession. Yet, military logisticians do not often spend time studying the history of military logistics.

There are at least three general lessons from history that might prove of some use in understanding how best to prepare for the future. The first of these is the best case operationally is often the worst case logistically. The second is promises to eliminate friction and uncertainty have never come to fruition. And the third is technological change must be accompanied by organizational and intellectual change to take full advantage of new capabilities. While these lessons are not exclusive to logistics, when applied to the understanding and practice of military logistics, they provide a framework for understanding the past and planning for the future.

Colonel Karen S. Wilhelm, USAF

Concentration and Logistics

To win in battle we must concentrate combat power in time and space. Strategy and tactics are concerned with the questions of what time and what place; these are the ends, not the means. The means of victory is concentration and that process is our focus here. There are only four key factors to think about if we seek success in concentration. This is not a simple task. Although few in number, their impact, dynamics and interdependencies are hard to grasp. This is a problem as much of perspective as of substance. It concerns the way we think, as much as what we are looking at. The factors are not functions, objects or even processes. They are best regarded as conditions representing the nature of what we are dealing with in seeking concentration. They are as follows. Logistics is not independent. It exists only as one half of a partnership needed to achieve concentration. Why is understanding this so important? Logistics governs the tempo and power of operations. For us, and for our enemy. We have to think about the partnership of operations and logistics because it is a target. A target for us, and for our enemy. Like any target, we need to fully understand its importance, vulnerabilities and critical elements to make sure we know what to defend and what to attack. All military commanders, at all levels of command, rely on the success of this partnership. How well they understand it will make a big difference concerning how well it works for them and how well they work for it.

Wing Commander David J. Foster, RAF

INSIDE LOGISTICS



EXPLORING THE HEART OF LOGISTICS

Interim Global Logistics Support Center Supply Chain Management Capabilities

Steven B. Reynolds, PhD, LMI
Robert K. Ohnemus, LMI
Phillip B. Waugh, Centech Group
Antoinette Y. Briggs, 754th ELSG/LRS
Herbert H. Hunter, Jr, 754th ELSG/LRS

It's not good enough to be capable of fighting big armies and big navies and big air forces on a slow, ponderous basis. We have to be able to move quickly and have to be agile and have to have a smaller footprint. And we have to be able to deal with the so-called asymmetrical threats, the kind of threats that we're facing with terrorists and terrorist networks.¹

—Former Defense Secretary Donald Rumsfeld

The Logistics Transformation Requirement

The Air Force is undergoing a significant transformation with the ultimate objective of restructuring the force to address the threats of the 21st century. The transformation effort is enormous, affecting all aspects of Air Force warfighting capabilities.

The Air Force Research Laboratory has identified six long term challenges that will be the keys to successfully transforming the Air Force. One of those six is the need to develop "...solutions that will improve or enhance the Service's ability to provide agile combat support (ACS) to the warfighter, such as reducing the deployment footprint, improving asset visibility, and improving logistics command and control."² In fact, the Defense Science Board Task Force on Logistics Transformation concluded that:

For the US military to maintain its position of global leadership, it must transform its logistics system. Failure to do so imperils our ability to deploy and sustain our military forces to meet the new threats we will face in the future.³

The Logistics Transformation Plan

Air Force logisticians have been hard at work in recent years to transform logistics support concepts, processes, and data systems to ensure that the structure and management of the Air Force supply chain supports overall Air Force transformation objectives. The primary Air Force logistics transformation effort is called Expeditionary Logistics for the 21st Century, or *eLog21*.

The mission of *eLog21* is to develop and implement transformational concepts, processes, systems, and policies to deliver dependable, effective, and efficient ACS to the 21st century aerospace expeditionary force.⁴ In 2006, the *eLog21* effort resulted in a recommendation to the Air Staff stating that the Air Force logistics transformation objectives can be best delivered via the acquisition and implementation of a commercial off-the-shelf (COTS), enterprise resource planning (ERP) system. The recommendation has been accepted, and the Air Force is now preparing to document the future Air Force logistics functional requirements for implementation in an ERP software suite. The future Air Force logistics enterprise system, called the Expeditionary Combat Support System (ECSS) will implement four key design elements.

- The system will be managed as a single enterprise focused on meeting warfighter requirements timely and affordably. Process integration will eliminate the vertical functional and organizational stovepipes of the past. Enterprise-wide logistics resources will be managed in a shared data environment for more responsive and accurate decisionmaking.
- The system will focus on customer support and drive execution based on enterprise operational goals.
- The Air Force logistics structure will be redefined to become network centric with dynamic command, control, communication, information, and instant feedback permitting rapid supply chain reconfiguration.
- Legacy functions, organizations, or processes that do not support Air Force core competencies will be eliminated or outsourced.

The current ECSS procurement, development, and implementation schedule indicates the future enterprise logistics system will be rolled out across the Air Force in 2012. However, a recent Air Staff briefing⁵ suggests an immediate need to maximize our efforts to implement enterprise supply chain management processes as soon as possible.

- Personnel costs have risen by 50 percent in the last 10 years, despite manpower reductions.
- Aircraft fleet operations and maintenance costs have increased by 87 percent in the last decade.
- The aircraft fleet is aging.
- Air Force investment budgets have declined significantly since 1986, and the future budget picture is not bright.

In terms of the need for enterprise Air Force supply chain management capabilities, the future is now. In fact, the Air Staff has already established a new organization called the Global Logistics Support Center (GLSC) to manage the Air Force supply chain. The GLSC is responsible for conducting enterprise supply chain planning, providing global command and control of the Air Force supply chain, and acting as a single focal point for supply chain support for the full range of Air Force operations. Even though the GLSC is responsible for the management of the entire Air Force supply chain, it has very few enterprise supply chain management tools. The GLSC needs integrated, near real-time, actionable supply chain data to ensure logistics managers have complete visibility of enterprise logistics requirements and resources, and the tools to centrally manage those resources to optimize logistics support and maximize mission capabilities.

Developing Interim Supply Chain Management Tools

The 754th ELSG has been commissioned by the Air Staff to develop interim enterprise supply chain management tools to maximize GLSC capabilities pending the delivery of ECSS. To deliver those capabilities, the 754th is developing rule-based applications within the GCSS-AF integrated framework (IF). The GCSS-AF IF service-oriented architecture (SOA) enables loosely coupled data exchange services between existing (legacy) software systems to support the functional requirements of the software users.⁶ GCSS-AF SOA web-based applications can be accessed with reduced sign-on from anywhere access to the Internet is available. These web-based applications can communicate with legacy systems to make a collection of applications look seamless. Figure 1 provides an example of how SOA enables rule-based applications that are being used to bring Air Force logistics legacy system data together to provide enterprise supply chain management capabilities to the GLSC.

By using the GCSS-AF SOA approach, enterprise supply chain data from disparate legacy data systems can be passed between legacy data systems, merged into comprehensive enterprise data views, and even used to initiate legacy system transactions to update and reconcile data across the legacy systems—all without making

any major changes to legacy data systems. This is a key point. Once the Air Force decided to develop ECSS as the future enterprise logistics management system, funding for modifying and enhancing logistics legacy systems was redirected to support ECSS costs.

Figure 2 provides a summary of the interim enterprise supply chain management capabilities that the 754th ELSG has already developed, is currently developing, and those capabilities that are being evaluated for future development.

The capabilities summarized in Figure 2 represent a significant step forward in providing the GLSC with interim enterprise supply chain management tools. It is also important to note another contribution made by these developments. In developing the functional requirements underlying these GLSC supply chain management capabilities, we consulted with, and sought the advice from, leading Air Force logistics experts. Further, when we tested these tools, we enlisted the direct assistance of the GLSC managers that will be implementing the new capabilities to manage the Air Force enterprise supply chain. We used the feedback from the GLSC managers to refine the tools during the testing process. Since we obtained the initial requirements for these tools from GLSC managers, and then updated the tools based on their feedback, the collective capabilities provided by the GLSC tools provide a solid baseline for the blueprinting of ECSS functional requirements. In other words, the GLSC supply chain management tool set (development, implementation, and refinement) over the next 5 years will provide the ECSS developers with a set of *road tested* enterprise supply chain management capabilities. In addition, these capabilities will make our legacy systems more accessible to modern messaging and transaction formats, which will ease the implementation of ECSS components, and better facilitate legacy system interfaces to other modern logistics systems.

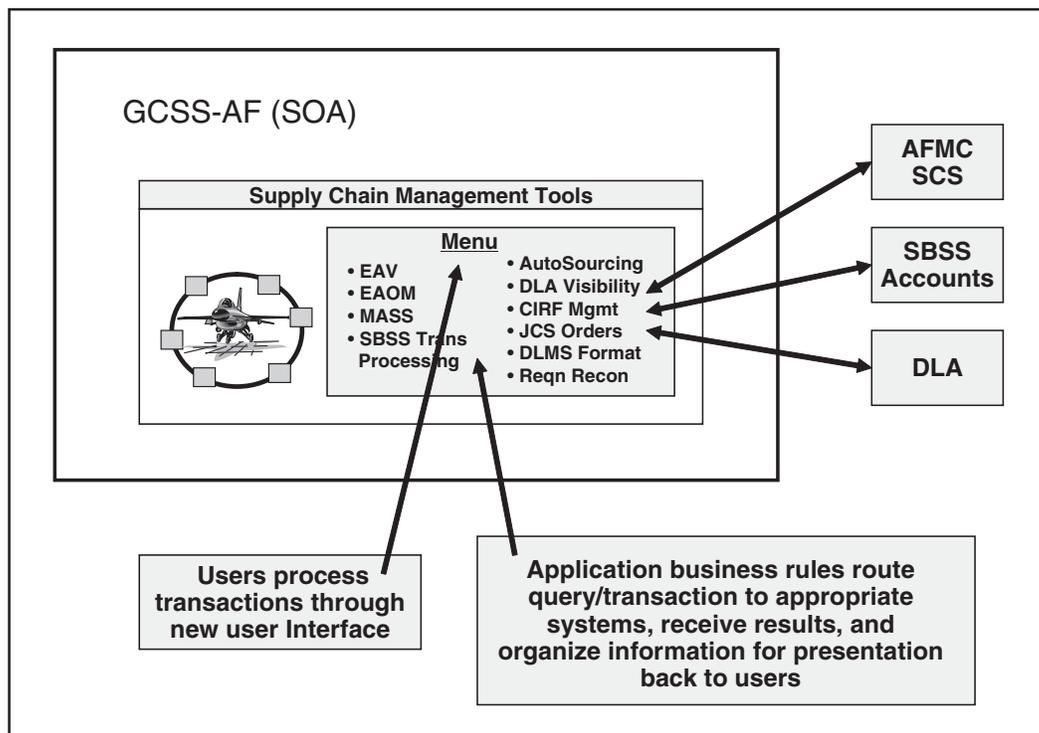


Figure 1. Illustration of a Rule-Based Application on the GCSS-AF SOA

Application Development Summaries

The following paragraphs summarize the interim GLSC supply chain management capabilities the 754th ELSG is providing. This collection of applications provides the GLSC with the enterprise asset visibility and supply chain management tools needed to manage Air Force logistics resources until ECSS is fielded.

- **Initial Enterprise Solution—Supply (ES-S) Developments.** The 754th ELSG first began to explore how SOA tools could be used to integrate data across disparate legacy logistics systems in 2004 through a proof of technology effort funded by AF/ILI.
 - **Enterprise Asset Visibility (EAV).** Our initial ES-S development, called EAV, had the objective of creating a near real-time unified view of the Stock Control System (SCS) and the Standard Base Supply System (SBSS) asset data. Prior to the development of EAV, logistics managers would have had to query more than 300 separate SBSS accounts and 3 SCS accounts, and then manually collate those query results to obtain a global view of on-hand inventory across all locations. Through the use of SOA tools like enterprise application integration, we were able to develop a near real-time global view of assets across all SBSS and SCS locations that users can access within a few seconds.
 - **Enterprise Asset Order Management (EAOM).** The EAOM component provides similar query capabilities for customer orders. The details and status of orders can be obtained directly from the back order source and displayed side by side to provide a complete picture of the order.

While this capability provides obvious benefits to supply customers, it also provides important information to suppliers. For example, prior to EAOM development, wholesale item managers did not know the intended customer use of spares because the requisition data alone does not provide end use application data. By combining information from base level systems with wholesale systems, managers are able to link the requisition to the end use customer requirement. The EAOM component also proved that with the push of a button within the ES-S application, SBSS, and SCS legacy system transactions can be simultaneously initiated to move assets to satisfy priority needs at other bases.

- **SBSS Web-Based Transaction Processing.** The SBSS web-based transaction processing project provides logistics support center managers with expanded capabilities to process over 170 different SBSS legacy transactions using simple web-based graphical user interfaces (GUI). This tool also allows enterprise managers to process transactions against one or more SBSS accounts without having to sign on to each SBSS instance separately (only Air Force Portal user ID and portal role required). Also, an entry point (web service) for other systems to send SBSS transactions directly to specific SBSS accounts has been developed. Finally, this ES-S web service sets the stage for improved interfaces and connectivity to ECSS.
- **Mission Capable Asset Sourcing System.** The Mission Capable Asset Sourcing System (MASS) is a fundamental capability required by the GLSC. In fact, as you will see, a number of the GLSC tools described in this article will be implemented as expansions of the MASS function. Initially, a new version of MASS was hosted on the GCSS-AF integration framework and made accessible via the ES-S Homepage on the Air Force Portal. This version of MASS replaces the MASS application hosted on the SBSS mainframes and some client-side software on individual PCs. The MASS component utilizes data in a web-enabled, shared, single-entry, near real-time environment to support the management and sourcing of mission capable (MICAP) and awaiting parts (AWP) back orders. This provides a more accurate picture of the actual position of assets for sourcing decisions, and the creation of global historical views for analysis. This new MASS capability also replaces the MICAP reports builder created by the Combat Air Forces Logistics Support Center. The following list provides a high-level summary of MASS capabilities.

- Provides a single point of access via the Air Force Portal (no need for separate user ID and password for each separate SBSS account).
- Provides the first consolidated (global) view of active MICAP and AWP back orders in a single database.
- Allows near real-time management and sourcing of MICAP and AWP back orders across all SBSS accounts. The MASS database is synchronized with SBSS using a new Logistics Event Notification Service that reports new or changed orders to MASS. Also, MASS now utilizes ES-S *query asset* type capability to locate assets across the enterprise in near real-time.
- A tailorable workflow approach to managing MICAPs. In other words, GLSC managers (and other users) will be able to choose which MICAPs to manage using urgency justification codes (UJC), standard reporting designators

Article Acronyms

AFDS – Air Force Data Services
ACS - Agile Combat Support
AFMC - Air Force Materiel Command
AWP - Awaiting Parts
BTA - Business Transformation Agency
CIRF - Centralized Intermediate Repair Facility
DLA - Defense Logistics Agency
DLMS - Defense Logistics Management System
EAOM - Enterprise Asset Order Management
ERP - Enterprise Resource Planning
ECSS - Expeditionary Combat Support System
ES-S - Enterprise Solution-Supply
EXPRESS - Execution and Prioritization of Repair Support System
EWT - EXPRESS Web Toolkit
GCSS-AF - Global Combat Support System—Air Force
GLSC - Global Logistics Support Center
GUI - Graphical User Interfaces
IF - Integrated Framework
JCS - Joint Chiefs of Staff
MASS - Mission Capable Asset Sourcing System
MICAP - Mission Capable
MILS - Military Standard
PDM - Programmed Depot Maintenance
SOA - Service Oriented Architecture
SCS - Stock Control System
SBSS - Standard Base Supply System

(SRD), federal supply class (FSC), and so forth. MICAPs are then categorized in *buckets* based on their status. For example, new MICAPs will show up in a *new* bucket that indicates that action must be taken to satisfy the requirement. As the MICAP is worked (requisitioned, shipped, and so forth), it will be recategorized. This approach allows managers to quickly see how many MICAPs are in each category and what action is necessary to ensure the needs are satisfied on a timely basis.

- Global history data to all authorized users.
- **GLSC Tool Set.** In the fall of 2006, the Air Staff tasked the 754th ELSG to develop additional SOA-based supply chain management capabilities in support of GLSC capability requirements. These capabilities will be fielded in September 2007.
 - Requisition Reconciliation. Numerous analyses have documented that significant problems exist between Air Force wholesale supply systems and retail (or base level) supply systems in accurately communicating and reconciling base materiel orders and order status. One study indicated 42 percent of in-transit and 29 percent of back-order data for Air Force Materiel Command (AFMC)-managed items were inconsistent. A subsequent study of Defense Logistics Agency (DLA) back-order data indicated DLA had over 28K requisitions that did not match SBSS requisition records, and the SBSS had over 24K requisitions that did not match DLA requisition files. It is critically important for suppliers to have accurate base requisition data. Failure to quickly identify and reconcile mismatched base and supplier requisition data for all sources of supply results in logistics support delays, reduced mission capability, and misallocation of repair and distribution resources. To ensure the timely and accurate communication of warfighter needs to supply sources, the 754th ELSG is developing a component to implement business rules for reconciling base and supplier requisition data. The component will use daily wholesale supplier (AFMC and DLA) and base (SBSS) requisition data feeds from GCSS-AF Data Services (AFDS) to identify and reconcile mismatched requisitions between the retail supply and wholesale supplier data systems.
 - Automatic Sourcing. This GLSC capability development will use near real-time asset and requirements data from source systems (SBSS, SCS, and DLA) to automatically determine the best enterprise source for fulfillment of selected priority (MICAP, AWP, and Joint Chiefs of Staff [JCS] project-coded)

requisitions and create the appropriate legacy system transactions to effect the movement of the assets from the selected source. The capability will include a new direct transaction interface to the Defense Automatic Addressing System for the routing of orders for non-AFMC-managed items that are not automatically sourced from alternate locations. The capability will also allow GLSC supply chain managers to suspend or start automatic sourcing as needed (for a specific requisition, stock number, base), and to tailor the sequence in which sourcing business rules are applied (requisition to wholesale source of supply, use lateral support first, or alter the prioritized sequence of competing enterprise needs). This capability also provides an automated *reverse sourcing* feature that reacts to the introduction of assets into the enterprise. Whenever assets become available, the reverse sourcing feature scans existing enterprise needs to determine whether the assets should be redirected to satisfy high priority needs. The reverse sourcing feature uses the daily Execution and Prioritization of Repair Support System (EXPRESS) distribution prioritization list to determine which enterprise back orders should be fulfilled in cases where there are competing requirements for available assets. The implementation of these automatic sourcing features provides two important benefits. First, the embedded business rules ensure that enterprise objectives are rationally considered in sourcing decisions. Second, by automating the sourcing process, GLSC managers are relieved of a very time consuming process and are freed to focus on other supply chain management duties.

- DLA Asset and Order Status Visibility. This initiative requires the development of a direct communications interface between Air Force and DLA systems to provide GLSC managers with near real-time DLA asset and order status data.

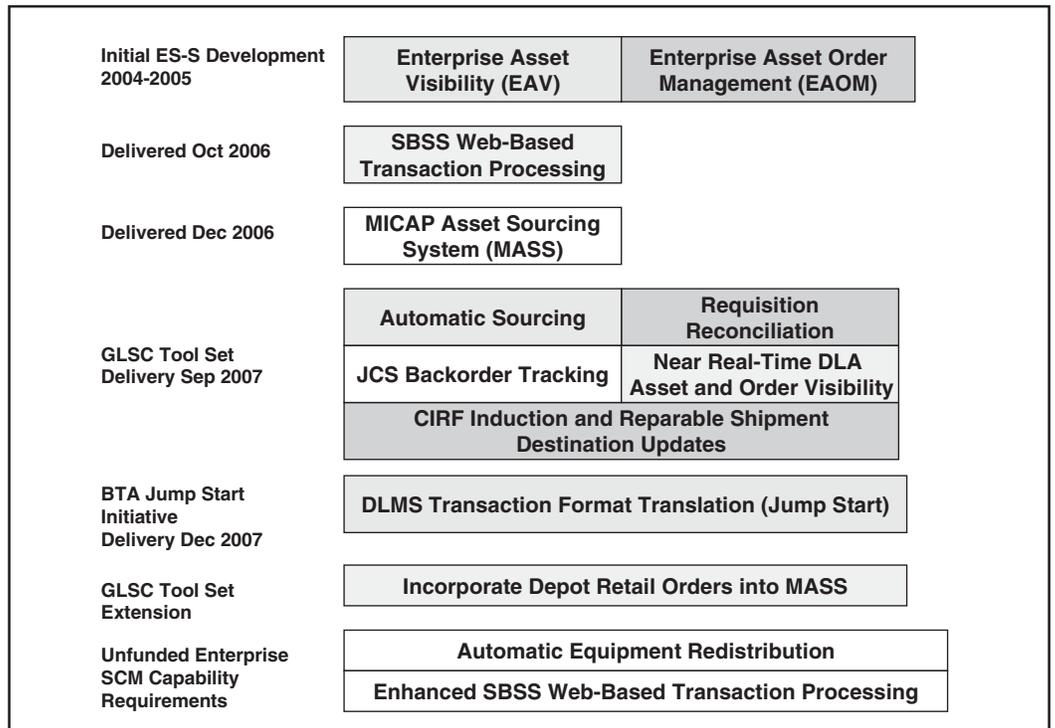


Figure 2. Interim Enterprise Supply Chain Management Capability Development

- **Near Real-Time Asset Visibility.** Near real-time asset visibility information will enable the GLSC to smartly source consumable weapon system items that cause more than half of all MICAP conditions. The GLSC currently has near real-time access to only Air Force base asset data. As a result, GLSC enterprise logistics managers may source priority customer needs for DLA-managed items from another retail account when, in fact, given the DLA asset position, the optimal enterprise decision might be to order the item from DLA instead. GLSC access to near real-time asset data will enable logistics managers to look across the enterprise to optimally source high priority customer orders.
- **Near Real-Time Order Status Information Capability.** The direct communications interface developed for the asset query capability will provide GLSC managers with the ability to query existing Air Force orders to determine, in near real-time, the status of requisitions. The development of a near real-time order status query capability will enhance GLSC asset sourcing and cannibalization decisions, thus enabling logistics managers to better meet enterprise logistics support objectives.
- **JCS Project Coded Order Management.** The Air Force Spares Priority Release Sequence dictates that JCS-project coded requirements be given precedence over non-JCS-coded MICAP and AWP orders. To provide the GLSC the capability to effectively manage JCS Project-coded orders, SBSS JCS order data will be presented in the MASS application, and made available to the automatic sourcing logic. The inclusion of these orders within MASS will ensure JCS orders are visible to GLSC managers and are managed or sourced commensurate with the priority of need.
- **Centralized Intermediate Repair Facility Management.** HQ AFMC is currently extending the execution and prioritization of the repair support system (EXPRESS) to manage all enterprise repair actions, including centralized intermediate repair facility (CIRF) inductions. We are complementing that effort by developing two new GLSC capabilities.
 - **Induction Management.** The first of these two requirements is to obtain the data for implementing the daily EXPRESS enterprise repair induction list for CIRFs. The system will automatically induct unserviceable reparable (using SBSS legacy transactions) into the CIRF for repair. That process is illustrated in Figure 3.
 - **Reparable Shipment Destination Management.** The GLSC CIRF managers update a table within EXPRESS via the EXPRESS web toolkit (EWT) to indicate which forward bases are served by which CIRF, for what items. It is vital that whenever base-to-item-to-CIRF mappings are changed in EXPRESS, those changes are also updated in SBSS reparable shipment records. If those updates are not correctly reflected in the SBSS, bases will ship their reparable carcasses to the wrong enterprise repair locations. We are developing a capability that will use a daily EXPRESS data file to synchronize SBSS reparable shipment destinations with the EWT tables. The process is illustrated in Figure 4.
- **DLMS Transaction Format Translation.** The DLA business system modernization process and other modern logistics data systems are designed to communicate via variable length defense logistics management system (DLMS) American National Standards Institute (ANSI) Accredited Standard Committee (ASC) X12-compliant transactions. However, legacy Air Force logistics systems communicate via fixed length military standard (MILS) transaction formats. The ability to convert legacy system MILS formatted transactions to the DLMS standards would benefit the customer order and status transaction flow between the Air Force supply system and DLA systems, and would set the stage for enabling communication between (and eventual transition from) the Air Force's legacy supply systems and other COTS enterprise resource planning (ERP) systems. The Business Transformation Agency (BTA) has endorsed and promoted the DLMS migration initiative and is encouraging the components to accelerate DLMS conversion through the DLMS Jump Start Program. The DLMS Jump Start Program is designed to incentivize Department of Defense Components to migrate legacy systems from MILS to DLMS. The BTA has funded the 754th ELSG to develop the capability to transform selected inbound and outbound transactions as a first step in developing the capability for directly interfacing to data systems that use DLMS ASC X12 transactions. The development of this new transaction transformation capability will eventually provide the GLSC the ability to more directly communicate with suppliers in placing orders and obtaining order status. The variable length nature and new data elements supported in the DLMS formats will also support the eventual introduction of new business processes such as the tracking of unit identifications and online part number (DD Form 1348-6) requisitioning. Further, because the development of this DLMS conversion function will be accomplished using the GCSS-AF SOA, the capability will be useable for transforming legacy transactions for other GCSS-AF-hosted legacy systems.
- **Depot Retail Order Management in MASS.** Air Force warfighter retail supply support consists of two vital parts. The first part consists of the operational unit supply activities that directly support warfighter spare parts and component needs—essentially, the SBSS accounts around the world. The second vital component of warfighter supply support is comprised of *depot retail* activities. As shown in Figure 5, depot retail activities support two primary customers—programmed depot maintenance (PDM) and depot component repair.

The previously described MASS and automatic sourcing features do not currently include visibility of depot retail supply (D035K) requisitions that support PDM activities and depot component repair. The lack of an integrated GLSC view of visibility into D035K requisition data creates an enterprise blind spot. In fact, depot retail supply needs can often compete with operational activity supply support activity needs for the same assets. Therefore, the lack of near real-time visibility of all enterprise asset requirements could result in erroneous GLSC asset distribution decisions. The GLSC would clearly benefit from the incorporation of D035K requisition visibility into the GLSC supply chain management tool set; therefore, we are working with depot retail supply experts to pursue the development of the following capabilities.

- Extend MASS to manage MICAP, AWP, and JCS project coded requisitions at depot retail (D035K) accounts
- Extend automatic sourcing capabilities to include D035K requisition sourcing
- **Automatic Equipment Redistribution.** Air Force Logistics Management Agency studies have documented that there are hundreds of enterprise opportunities to redistribute millions of dollars worth of excess base-held serviceable equipment items to satisfy unfilled authorizations at other bases. The GLSC could benefit from an automated capability that uses SBSS, the Air Force Equipment Management System, or AFDS data to identify opportunities for redistributing equipment items among bases when appropriate to improve global mission support. Although this initiative is not funded for development at this time, there is clear interest in fielding an automated equipment distribution capability. As a result, the 754th ELSG was tasked by the 79th Air Force Materiel Management Board to develop a rough order of magnitude cost and schedule estimate for developing that capability.
- **Expand SBSS Web-Based Transaction Processing.** The SBSS web-based transaction processing feature could provide additional benefit to the Global Logistics Support Center (GLSC) via the incorporation of all the remaining (beyond the 170 already provided) SBSS transactions and screens into the GCSS-AF SOA. When completed, access to the SBSS green screens and the use of terminal emulation software on the client computer will no longer be needed by any SBSS user. This would enable specialized users like SBSS computer operators, warehouse personnel, and finance personnel to process all of their legacy system transactions via a web-based GUI.

Summary and Conclusions

Five years from now, the ECSS will be the Air Force system for managing the enterprise supply chain. However, the GLSC has an immediate requirement for integrated, near real-time, actionable enterprise supply chain data, and the ability to centrally manage logistics resources to optimize support and maximize mission capabilities. The 754th ELSG is exploiting the service-oriented architecture to develop rule-based applications on the GCSS-AF framework to provide the GLSC with interim enterprise supply chain tools pending the delivery of ECSS. The interim supply chain management capabilities provided by these rule-based applications will provide the GLSC with vital, fundamental enterprise management capabilities and establish a solid baseline for the blueprinting of ECSS functional requirements.

Notes

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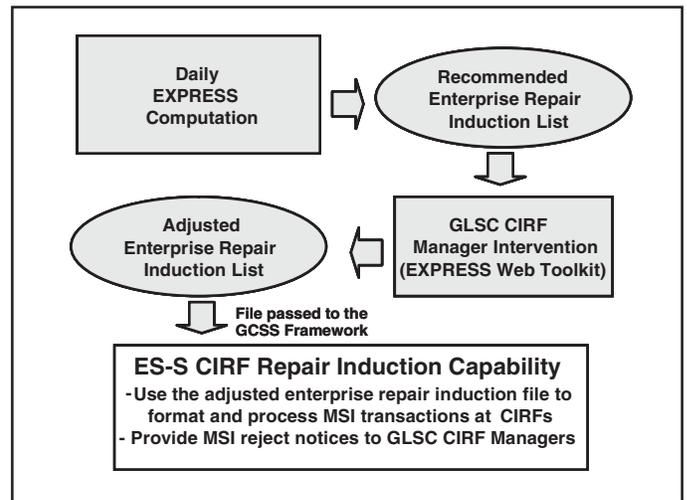


Figure 3. Implementation of the EXPRESS Enterprise Repair Induction List

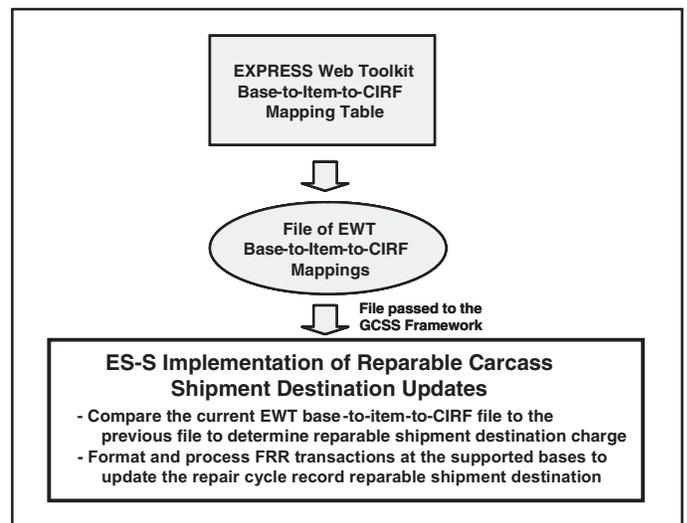


Figure 4. Implementation of Repairable Carcass Shipment Destination Updates

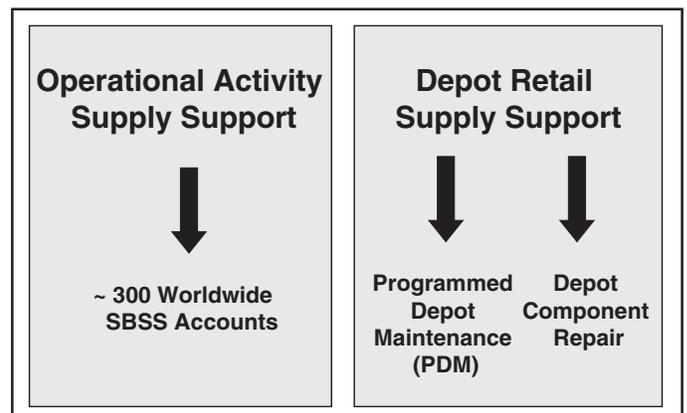


Figure 5. Warfighter Retail Supply Support Activities

Dr Steven B. Reynolds is a research fellow with LMI. He is a logistics expert at the Headquarters 754th Electronic Systems Group, Supply Systems Branch, Maxwell Air Force Base, Gunter Annex, Alabama. He is currently leading the development of the functional requirements for the Global Logistics Support Center for a near real-time data link with DLA and the requirements for implementing centrally computed enterprise repair decisions.

Robert K. Ohnemus is a research fellow with LMI. He is a logistics expert at the Headquarters 754th Electronic Systems Group, Supply Systems Branch, Maxwell Air Force Base, Gunter Annex, Alabama. He is currently leading the development of the functional requirements for the Global Logistics Support Center automatic supply sourcing capability.

Phillip B. Waugh is a senior business analyst with the Centech Group. He is a logistics expert at the Headquarters 754th Electronic Systems Group, Supply Systems Branch, Maxwell Air Force Base, Gunter Annex, Alabama. He is currently leading the development of the functional

requirements for the Global Logistics Support Center capability for the reconciliation of customer and supplier requisition data.

Antoinette Briggs is the lead supply systems functional expert and software test manager for the Supply Systems Branch, Headquarters 754th Electronic Systems Group, Maxwell Air Force Base, Gunter Annex, Alabama. She is responsible for overall functional requirements development, and the functional as well as operational testing of the Air Force Integrated Logistics Support System–Supply Systems software, including all the Global Logistics Support Center tools described in this article.

Herbert Hunter, Jr, is the deputy chief of the Supply Systems Branch, Headquarters, 754th Electronic Systems Group, Maxwell Air Force Base, Gunter Annex, Alabama. He is responsible for the development and sustainment of the Air Force Integrated Logistics Support System–Supply System, including the delivery of the Global Logistics Support Center tools described in this article.



Logistics Analysis

**First Lieutenant Beau Nunnally, USAF
Captain Benjamin Thoele, USAF**

Introduction

The current focus in logistics analysis relies heavily on the use of averages. There are instances where predictive modeling is used; however, data requirements for predictive modeling to be accurate are often not being met by the logistics community.

Predictive modeling, probability management, and stochastics provide a backbone for data analysis requirements in tomorrow's Air Force logistics community. In order for these techniques to provide real benefit, data integrity must be maintained. The implementation of an Enterprise Resource Planning (ERP) system in the logistics enterprise allows for an integrated common database, alleviating errors and wait time in transferring data between logistics systems. In the logistics community of the Air Force, the ERP system, along with the demand planning and repair scheduling programs is called the Expeditionary Combat Support System (ECSS). As the logistics community moves to install ECSS, new analysis techniques can be used to more accurately predict future requirements for manpower, transportation, supply, maintenance, and other areas of agile combat support throughout the logistics enterprise.

Article Acronyms

ECSS - Expeditionary Combat Support System
ERP - Enterprise Resource Planning
LCOM - Logistics Composite Model
SEP - Shell Exploration and Production

Current State of Logistics Analysis

Throughout the logistics world, the Air Force uses averages in metrics and decision support. Examples include determining stock purchases by averaging pipeline transportation and repair times in conjunction with average demands, determining schedules of transportation assets based on average required capacity, and buying jet fuel at an average rate per year. The dangers associated with averages can be put into categories:¹

- **The Family with 1.5 Children.** The average data does not take into consideration the actual population. When transportation times for items are entered into Air Force computer systems, such as the D200 Requirements Management System, average times are used. These averages do not often capture the reality of transportation times, as illustrated by the fact that they are used less than 35 percent of the time. These transportation times are used to determine pipeline length, and subsequently, purchase requirements. The danger of errors and poor data management results in significant back orders.²
- **Ignoring Restrictions.** When preparing for average demand, a certain amount of capacity is allocated to meet that demand. If demand exceeds capacity, demand is limited by capacity. If capacity exceeds demand, overcapacity exists. Using the average required capacity to schedule transportation assets for Air Mobility Command to be used by United States Transportation Command presents this danger. If the demand for assets is lower than the capacity, assets will be underutilized. Conversely, if demand is higher than the required capacity, throughput will be limited by the capacity of transportation assets. This problem becomes more evident when combining the weight, cube, and palletization of assets.³

- **Ignoring Optionality.** On a commodity with volatile prices and a constant demand, stockpiling during periods of low cost can offset the demand during periods of high cost. Using the projected average price on fuel, every fiscal year the fuel price for the Department of Defense, including jet fuel, is set as a fixed rate. This is a very different strategy than the established best practices in the airline industry. Southwest Airlines, the only profitable United States based airline, uses a process called fuel hedging. Hedging is the act of stockpiling fuel at periods of low cost, and not purchasing at periods of high cost. This act capitalizes on the volatility of fuel prices, and saves Southwest more than \$150M per quarter.⁴

Additional categories, illustrated by notional examples, include:

- **Why Everything Is Behind Schedule.** Delivery of 10 parts is pending. The delivery time for one part is uncertain and independent, but known to average 1 week with a 50 percent chance of being over or under. It is tempting to estimate delivery as 1 week, but for that to happen, each part would have to arrive at or below the average delivery time. This is the same probability as flipping 10 sequential heads on a fair coin.
- **The Egg Basket.** Consider 10 mission critical parts being transported on the same convoy and the alternate case of one mission critical part on each of ten convoys. If there is a one-in-ten chance of losing any convoy, then either strategy results in an average of nine parts reaching their destination. However, the first strategy has a one-in-ten chance of losing every part, whereas the second strategy has a one-in-10 billion chance of losing all of the parts.
- **The Double Whammy.** Consider an inventory of perishable items. Here there is a spoilage cost associated with having too many of the items. There is also a back order cost associated with having too few of the items. The cost associated with the average demand is zero, since items are stocked to meet average demand. However, on average there will be a cost associated with stocking items, as forecasts are very rarely identical to demands.

These examples illustrate the dangers associated with using averages. Use of averages is widespread in the Air Force and can limit the ability of logisticians to make informed decisions.

Future State of Logistics Analysis

Logistics in the modern era is driven by uncertainties that create a significant number of interdependent risks. If the underlying statistical relationships of the uncertainties driving these risks are captured during the planning process, they can be exploited to find the optimal risk-based tradeoff for increased logistics performance. A shift in information management that captures the statistical relationships of uncertainties is essential to management of risk, real options, and enterprise level logistics.⁵

As is seen in several programs throughout the Air Force, most notably the Logistics Composite Model (LCOM), the use of predictive management in making manpower decisions is essential to future operations. LCOM is a Monte Carlo simulation that uses simulated flying schedules to predict maintenance requirements. LCOM uses historical data, including the mean time between failures and the mean time to repair, to determine how many personnel and of what levels are required in each shop to handle the typical work flow. Given available data in current

maintenance systems, LCOM is the best tool to predict this manpower requirement.⁶ If data becomes more accurate and more available in the future, then all Air Force logistics functions can take advantage of predictive modeling and simulation to make manpower decisions. In the future state of logistics, additional factors in predictive management such as aircraft availability, spares packaging, spares leveling, and manpower decisions throughout logistics will need to be considered as the Air Force has to perform its mission more effectively with fewer people.

The adequacy of a simulation is limited by the availability of data and modeling of tradeoffs between variables. As is the case in many simulation applications, the oversimplification of data into averages inadequately accounts for uncertainty and risk. Often values of input such as time, manpower, and failure rates are simplified into mean, average, or *base case* values which serve as inputs and outputs from the model. The previous example of mean times taken from the D200 Requirements Determination System to simulate pipeline times in readiness-based leveling (RBL) computations⁷ illustrates this point. The current data accuracy, availability, and timeline does not support predictive analysis and simulation to aid logistics decisionmaking. A mature ERP system, however, can provide the logistics community with the data required to obtain underlying data trends required to perform predictive analysis.

ERP Defined

Gartner defines ERP as “a set of applications software that brings manufacturing, financials, distribution, and other business functions into balance.”⁸ In other words, an ERP is one system used to manage all operations within a business enterprise. ERP systems provide an organization with a database backbone. All data is fed into the backbone and updated to the rest of the enterprise in real time. With organizational systems’ barriers removed, business processes can focus on reducing the time wasted on handoffs between functional areas (the most common point of waste in most companies).⁹ In addition, most ERP systems are built and installed with industry-wide best practices for data management.¹⁰ This does not necessarily remove a competitive advantage that a company has; it does allow companies to model their enterprise processes around an industry proven process.

ERP systems have both risks and benefits associated with them. Some of the benefits are common data, real-time information and asset visibility, and enablement of business process reengineering. Some of the risks associated with ERP systems (specifically in their implementation) are that gaps can occur between the current state and future state capabilities, implementations frequently run over budget and behind schedule, and very little real cost benefits will be seen without major process modifications supporting the changing business data structure.¹¹

In order for the Air Force to meet the goals set by logistics enterprise architecture (LogEA) initiatives—20 percent increase in aircraft availability and 10 percent cost reduction¹²—and manpower cuts in the Program Budget Decision 720,¹³ major change is needed in both process management and system functionality. The legacy computer systems in the Air Force logistics enterprise are not capable of meeting the faster-paced communication capabilities required by today’s suppliers and

customers in the end-to-end supply chain of Air Force logistics.¹⁴ Much like the commercial world is driven by outside pressures to a new information technology (IT) system that can handle the increased communication and flexibility requirements of their suppliers and customers, the Air Force logistics enterprise must change to meet the increasing demand on our systems. ERP will be the Air Force's tool of the future to facilitate these business changes.¹⁵

The implementation of an ERP system within the Air Force logistics enterprise will allow for an integrated common database. This instantaneous availability of data allows for new tools to be more readily applied to data analysis. Instead of using averages, which have been shown to oversimplify variability when dealing with uncertain behavior, logisticians can use probability management to predict some uncertain behaviors.

Examples of Probability Management

Shell Exploration and Production (SEP) illustrates the use of probability management. In order to meet the demands of global uncertainties, SEP engaged in reorganizing into a global operating model engaged in the upstream activities of acquiring, exploiting, developing and producing oil and gas.¹⁶ This involved the combining of local and regional activities into a single, centralized business organization managing a large portfolio of venture opportunities, with data management at its core.¹⁷

Shell typically used a bottom-up assembly of exploration ventures into a business planning function. That is to say, each regional business section of Shell would develop and rank possible business ventures based on perceived risks and rewards. Shell made a transition to a top-down capital allocation approach that involved the use of stochastics. Shell developed a stochastic library involving factors such as hydrocarbon volumes, drilling and developmental costs, volumetric distributions, and economic values of exploration.¹⁸ SEP insured the libraries were simple to understand and easy to apply but detailed enough to be credible. Shell included individual libraries for global scenarios so that each venture could be assessed on the impact to the global environment. What Shell created was not a simple risk and reward tradeoff curve—instead the potential tradeoffs between several pairs of metrics could be seen. Management at Shell could open the graphic user interface and select or deselect investment projects with a click of the mouse. This action created a profile, driven through Excel formulas, where repetitions were driven by precalculated Monte-Carlo trials within the stochastic library. Because the simulations were not taking place at the mouse click, existing trials were being used, the statistical properties of the profile were immediately apparent.¹⁹

With this approach, management could now see various investment levels through group interactions within the model. The reward was that managers now were forced to focus on big picture issues, and the impact of their organization within the business enterprise.²⁰

The Shell approach is applicable for Air Force logistics. The current bottom-up approach involving the manipulation of wing level metrics can become a top-down assessment of how each wing can benefit or hurt the Air Force logistics enterprise. In order to accomplish this top-down approach, data integrity and availability must be ensured at the highest levels of planning.

Another example of an ERP implementation is Sloan Valve. Sloan Valve is a small company that is approximately 100 years old and has always remained privately owned. They manufacture bathroom equipment; in fact, they have 80 percent of the market on hands free bathroom fixtures in America. In 1998, Sloan Valve installed an ERP system but saw little initial return on investment from their system. They frequently undertook incremental investments that attempted to refine processes, what the Air Force calls continuous improvement. As Dr Michael Hammer describes this phenomenon of low return on investment, "chronic 'good enough' incremental investments deteriorate long-term market position."²¹ Seeing a need for dramatic change, Sloan used the ERP system as a catalyst to develop end-to-end business processes that focused on what, where, and when work needed to be done.²²

Another successful ERP implementation is Welch's. Evolving customer needs dictated a need to change, and management needed better visibility through the order management process. Welch's committed to an ERP system which involved business process reengineering at its core. The benefits they have seen from their ERP system include a decrease in total customer deductions for mistaken orders and missed contract deadlines. Deductions as a percentage of net sales dropped from 1.2 to 0.5 percent in a 2-year period. In addition, their days on hand of inventory and cash dropped from 25 days to less than three days, reducing the financial and logistics footprint of their business enterprise.²³

A common factor in the implementation strategies of Sloan Valve and Welch's involved changing their business processes to take advantage of data availability in ERP systems. These changes impact the throughput and efficiency throughout the business enterprise. The Air Force can expect similar, drastic changes to their business processes as ECSS is implemented. While dealing with the uncertainties of changes facing Air Force logistics, predictive analysis will provide the decisionmakers with the information needed to understand the tradeoffs of decisions. Predictive analysis allows for modeling and stochastic analysis of decisions before they are made, providing a decision support tool for agile combat support.

Conclusion

In order to meet the uncertainty of real world logistics situations, a predictive modeling technique for logistics analysis is required in the Air Force. Predictive modeling, probability management, and stochastics can be used in tandem to meet logistics analysis and data analysis needs of tomorrow's Air Force logistics community. Data requirements for this type of analysis are not being met by current logistics systems. The implementation of ECSS, the Air Force's ERP system, and the integrated database feature associated with the system, will meet the data requirements of this future state of logistics analysis.

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First Lieutenant Beau Numally, USAF, is the Lead Analyst, Logistics Analysis Branch, Logistics Analysis Division, Air Force Logistics Management Agency (AFLMA). He is also the lead analyst for AFLMA support to the Expeditionary Combat Support System. In his next assignment he will be an instructor at the Air Force Academy Preparatory School.

Captain Benjamin Thoele, USAF, is the Chief, Logistics Analysis Branch, Logistics Analysis Division, Air Force Logistics Management Agency



Logistics and Warfare

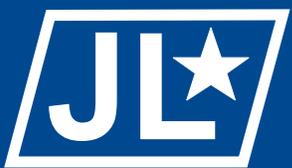
General Mathew B. Ridgway, of World War II fame, once observed, "What throws you in combat is rarely the fact that your tactical scheme was wrong ... but that you failed to think through the hard cold facts of logistics." Logistics is the key element in warfare, more so in the 21st century than ever before. Success on the modern battlefield is dictated by how well the commander manages available logistical support. Victories by the United States in major wars (and several minor wars or conflicts) in the 20th century are linked more directly to the ability to mobilize and bring to bear economic and industrial power than any level of strategic or tactical design. The Gulf War and operations to liberate Iraq further illustrate this point. Long before the Allied offensive could start, professional logisticians had to gather and transport men and materiel and provide for the sustained flow of supplies and equipment that throughout history has made possible the conduct of war. Commanders and their staffs inventoried their stocks, essayed the kind and quantities of equipment and supplies required for operations in the severe desert climate, and coordinated their movement plans with national and international logistics networks. "*The first victory in the Persian Gulf War was getting the forces there and making certain they had what they required to fight* [Emphasis added]. Then and only then, would commanders initiate offensive operations."¹ The same may be said of lightning quick victory in Iraq, although without the massive stockpile of inventory seen during the Gulf War.

In 1904, Secretary of War Elihu Root warned, "Our trouble will never be in raising soldiers. Our trouble will always be the limit of possibility in transporting, clothing, arming, feeding, and caring for our soldiers...."² Unfortunately, the historical tendency of both the political and military leadership to neglect logistics activities in peacetime and expand and improve them hastily once conflict has broken out may not be so possible in the future as it has in the past. A declining industrial base, flat or declining defense budgets, force drawdowns, and base closures have all contributed to eliminating or restricting the infrastructure that made rapid expansion possible. Regardless, modern warfare demands huge quantities of fuel, ammunition, food, clothing, and equipment. All these commodities must be produced, purchased, transported, and distributed to military forces. And of course, the means to do this must be sustained.

Notes

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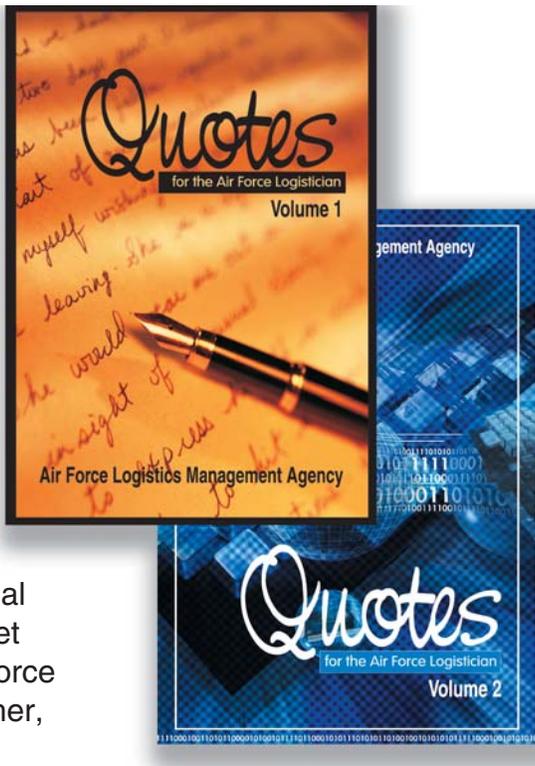


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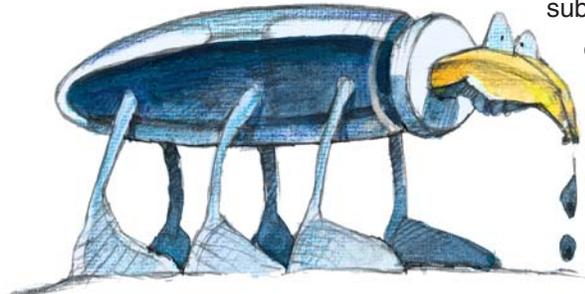


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