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Global Reach Laydown

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Since September 1994, Colonel Robert I. Lawrence has been the Chief, Planning and Scheduling Division, Office of the Inspector General, Headquarters Air Mobility Command (AMC), Scott Air Force Base, IL. In this position, he leads personnel and manages the logistics resources and program funds for Operational Readiness Inspection and Quality Air Force Assessment teams; establishes near- and long-term assessment schedules for all AMC active duty and AMC-gained Air National Guard and Air Force Reserve units; supervises the planning and implementation of joint and multicommand exercises to test and enhance their combat capabilities; oversees the preparation of detailed reports on unit capabilities; and briefs the AMC Commander on inspection results. Colonel Lawrence was commissioned through the Reserve Office Training Corps. He flew more than 2,000 hours in the C-141A weapon system, supporting operations in Southeast Asia, and was a select lead pilot in advanced aerial delivery techniques. He has served as an ICBM nuclear hardness and survivability project manager at the Space and Missile Systems Office; system safety engineer action officer on the KC-10 and airborne laser lab at the Inspection and Safety Center; Chief, Squadron Current Operations and Chief, Air Refueling Operations, at Altus AFB, OK; air operations analyst and deputy chief, Mobility Division, at the Pentagon; and commander of the 86th Military Airlift Squadron at Travis AFB, CA. From 1990–1992, he was Chief of the Joint Exercise and Training Directorate, U.S. Southern Command J-3, and was twice selected as Joint Task Force Commander in Chile and Paraguay. Between 1992 and 1993, Colonel Lawrence commanded the 438th Operations Group at McGuire AFB NJ. In September 1993, the Chief of Staff, Air Force, selected him as the Air Force Fellow at the Center for International Affairs, Harvard University.

Oettinger: Last year, while in residence over at the Center for International Affairs, Colonel Lawrence attended all these sessions and contributed to them mightily. You have seen the details of his biography, but I want to highlight one element of what he is going to give us.

You've heard a great deal of high-falutin' strategy and global this and that. None of the grand ideas that either I or others have spouted are worth a damn unless they eventuate in things happening where the rubber meets the road or the rubber meets the runway or the rubber departs from the runway on its way up—not to come down until it gets to some other place where it comes down gently. He is an expert in these matters of air transport and getting things from here to there on time and in the right place, and that's where it all comes together. I welcome his bringing us a wealth of the practical details that make a difference between whether high-falutin' ideas are just high-falutin' ideas or whether

they matter worth a damn. With that, Bob, it's a pleasure to welcome you back.

Lawrence: Thank you, sir. I appreciate it.

What I thought I'd do today, as Tony said, is give you a practitioner's point of view. I've been an operator in and out of this command for 20 years, doing different things at different levels. What I'm going to do today is talk about Global Reach Laydown, which is a concept of how we deal with the changing environment. The world was changed from a bipolar to a multipolar world. Our force structure has changed. Our missions have changed. What have we done to adapt to all that?

What we've done looks like what any organization has done. We've come up with a new organization. We've fused some existing organizations. We've refined some old systems and procedures, and bought some new communications gear.

Now, has that worked or not? We'll see. I'll go through some lessons learned

from our operations in Rwanda, operations in Haiti, and operations in the resupply of Kuwait in a few minutes. Also, my job as the inspector general is to set up readiness inspections, and I'll go through that and how we translate these lessons learned to the new theory of Global Reach Laydown.

I was talking earlier about the new composite wings in the Air Force. In July, we're going to bring about 20,000 people and about 200 aircraft together in Canada for a four-day war in a Pacific scenario. It's going to include F-15s, F-16s, B-1s, AWACS (Airborne Warning and Control System), all the types of cargo aircraft, and all the types of tanker aircraft, and hopefully we're going to get some Patriot and Scud missiles in there as well.

This is kind of an informal type of conversation, so please interrupt me whenever you have a question.

Oettinger: He's one of us, so ...

Lawrence: I took the jacket off and I'm thick skinned. My feelings don't get hurt. I'm prepared to go any number of avenues, so I have no script here. This is for you. As I was saying at the luncheon, of all the things I did at Harvard last year, I think this had the most practical payoff for what I'm doing now. It's about the final relative balances between things and who should do things. Sometimes you wonder about Tony's approach, but when you look back at it, it really does apply.

Oettinger: You hear that?

Lawrence: We'll use Global Reach Laydown as a case study. Global Reach is basically two 1,000-person organizations that we formed for use in any contingency or war scenario. We send these people out to plus-up the command and control for our mobility system. But before I get into that, I'll give just a brief discussion of what the Air Mobility Command (AMC) mission is, how the organization has changed, what the Global Reach strategy is, and some review, as I said, of the past operations.

The easiest way for me to think about AMC is captured in this illustration (figure 1). We have two types of airplanes. We

have tanker aircraft, which provide fuel to other aircraft to increase their range or increase their loiter time to do whatever mission they have to do. The other part is the cargo aircraft, which operate in a concept like a Pony Express-in-reverse. You want to move that cargo as quickly as possible so that airplane, or horse, just keeps moving. At different places around the globe, we switch riders. That's why you have stage bases to keep those planes moving. A plane taking off from McGuire Air Force Base in New Jersey going to Somalia can make that round trip in about 36 hours, but we'll have crews set in about three different locations to make that happen.

The other part of it that's not well understood (that is a force provider to theater commanders) is that if you go to a military base in the United States, you see medics, you see cops (security police), personnel experts, or civil engineers. Their duties are to assist in infrastructure maintenance (called base operating support [BOS]). But if a contingency happens, some of these people are required to deploy and go to a bare base somewhere else to make it operate, to make it viable, or to make an existing base more robust. So these are the three missions—air refueling, airlift, and force provider—and when we go through them, we'll talk in reference to all three of them throughout.

Basically, the C³I challenges for Air Mobility Command amount to how I deal with a transportation model that includes the following factors and problems. My requirement is to deliver it on time. I deliver the fuel in the air. I deliver cargo, people, and equipment on the ground, or provide BOS people to different bases. That's the problem: how do I get them there on time, and how do I meet their needs? Then how do I react? How do I react when the weather changes? How do I react when I have maintenance problems, or when people are shooting at us, or when I have operational problems because things have changed, or, more importantly, because the users decide they want to do something different? We're basically a service organization.

In the process of doing this in the last four years, we've come up with four
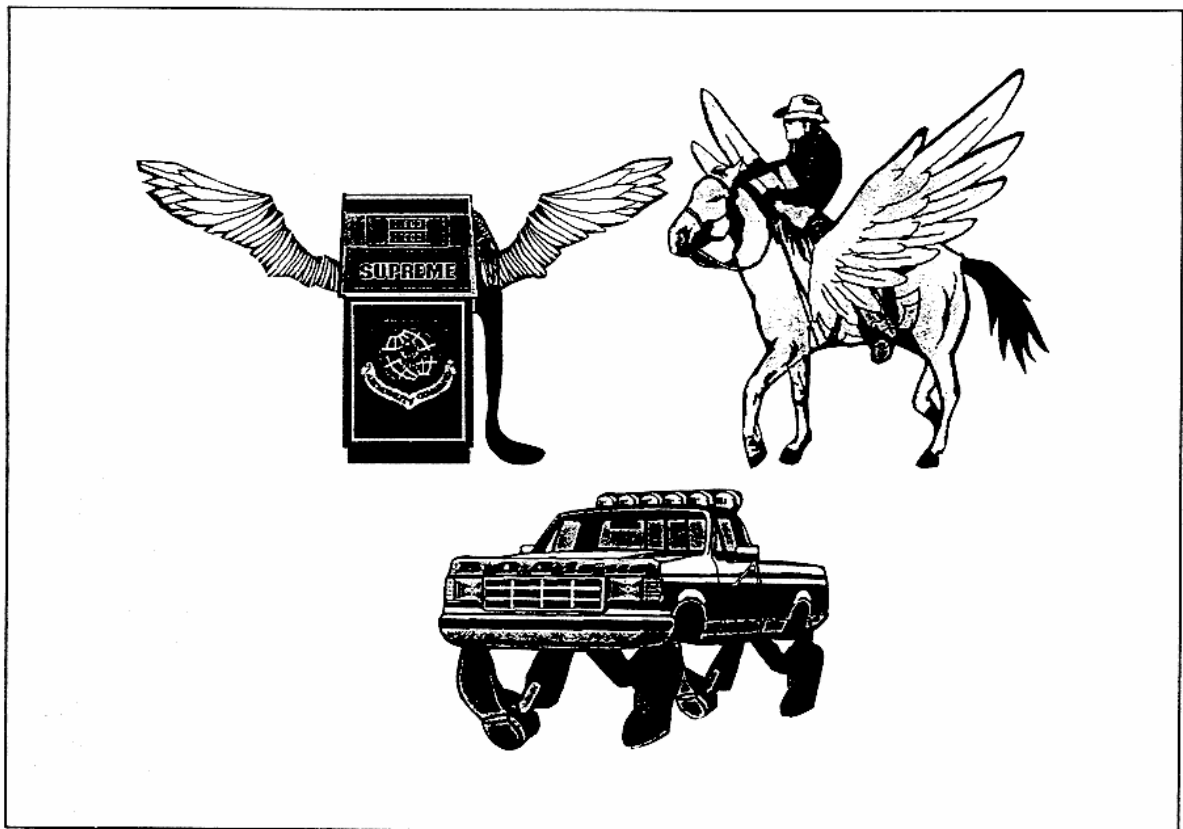
Figure 1
Mobility Doctrine

communications systems. The Army uses STACCS (Standard Army Command and Control System); the fighter community—the F-15s, the F-16s—uses a thing called CTAPS (Contingency Theater Automated Planning System). Our command uses two systems: GDSS (Global Decision Support System) and C²IPS (Command and Control Information Planning System). They're all computer programs with databases. Unfortunately, none of them talk to one another.

The other part of it is in-transit visibility. If you've ever seen a UPS or FedEx commercial on TV, customers ask, "Where's my parcel?" That's in-transit visibility. We in the military do not know how to do that consistently yet. If you're an Army unit and you want to know where your brigade is, or if you're an Air Force unit and you want to know where your spare engine is, good luck! We still haven't solved that. We know how to do it; however, it's breaking down at the operator

level as we input that data into the fields. We'll talk about that in just a second.

Oettinger: If I may be impertinent, isn't that already a thing you can purchase?

Lawrence: We've tried that.

Oettinger: And what happens? How does that get screwed up?

Lawrence: Because the services won't agree to buying the same system. We'll get there. That's a different story. I'll tell you that later.

Mobility is one of the five stated DOD missions, and what we have to be concerned with in mobility is four types of operations: (1) major regional conflicts (MRCs), in other words, another Desert Storm or a situation in Korea; (2) contingencies like Rwanda or Somalia;

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(3) humanitarian missions like the earthquake relief in Mexico City or in El Salvador; or (4) peacekeeping operations, wherever those may occur. Again, the three missions we have to do are the flying gas station, the Pony Express-in-reverse, and providing people to plus-up bases.

Let me switch gears on you here. Our organization has changed radically. After Vietnam and prior to Desert Storm, we were known as the Military Airlift Command (figure 2). We owned all the cargo aircraft, and the world was divided into two organizations for command and control purposes. It was divided by the Mississippi River to halfway around the world near India. Any airlift aircraft in the theater east of the Mississippi were commanded and controlled by the 21st Air Force commander. If you were in the Pacific, you were commanded by the 22nd Air Force commander. It was very clear who had command and control, and the en-route system had 39 locations overseas to make that

Pony Express-in-reverse work, so we could fly to any spots in the major theaters and keep the mission running.

Oettinger: Excuse me, I just want to make sure I understand. I presume the missions and what you were carrying and so forth were under your command, but that these folks would chop (change operational control) to the numbered Air Force when they were flying in this territory. Is that what was meant?

Lawrence: Correct. When I was stationed at Norton Air Force Base in Southern California, and I flew a mission to take munitions in during the Yom Kippur War in Israel, the minute we crossed the Mississippi River, we made all our communication reports to the 21st Air Force at McGuire Air Force Base. We would make position reports every hour and 20 minutes, tell them where we were in the world, and if we had any maintenance status concerns.
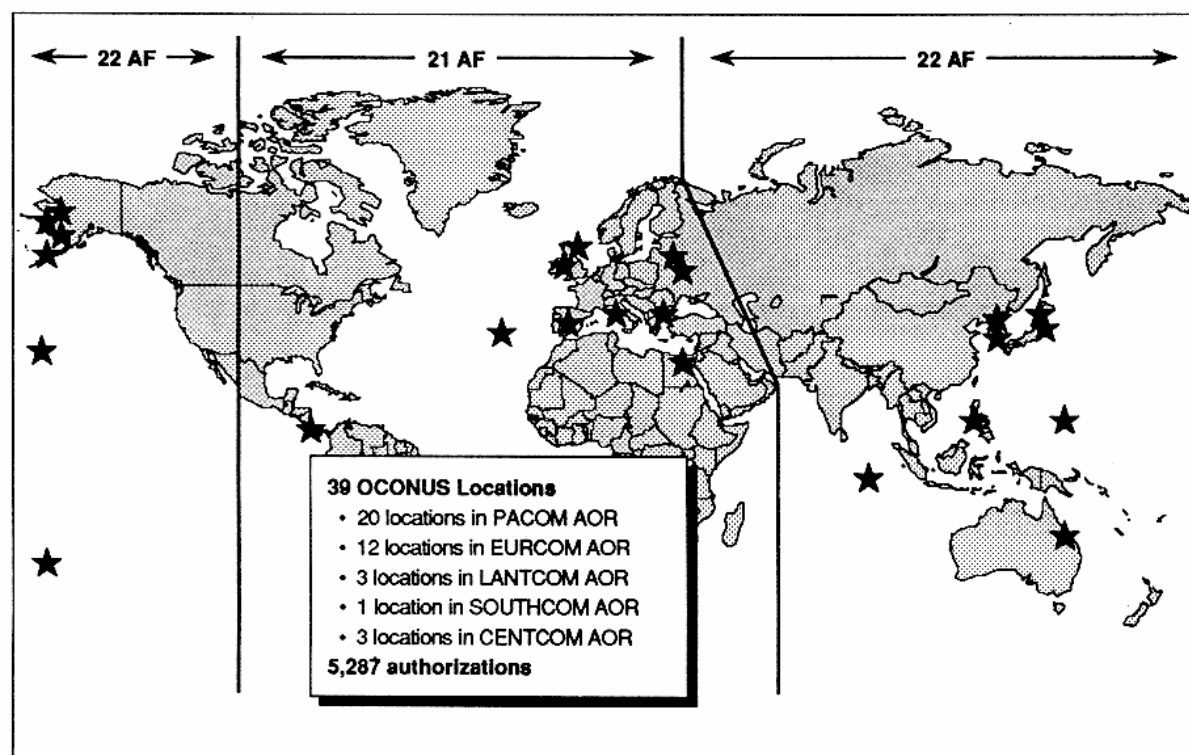

Figure 2
En Route Structure (Under Military Airlift Command)

Oettinger: I call that to your attention because those of you who were here last week will contrast that to some of the problems that were outlined with the *Liberty*, where when the shift changed in the command center, this didn't work properly. So every once in a while, somebody learns lessons, and what you heard here is a way of making it work when you go around into different people's
territories. I presume from what you're saying that it works.

Lawrence: It worked. But it worked so well, we changed it.

Oettinger: Ah, shucks!

Lawrence: I'll tell you why. We changed it for a very specific reason. After Desert Storm, what happened is that so much material was going into Southwest Asia that the numbered Air Force commander was overwhelmed. His staff was about 200 people versus a headquarters staff at Military Airlift Command that had about 2,000 people. He was getting questions from the different CINCs on "Where is my stuff?" "I need to change the flow. I need to do this. I need a centralized place to go to." The numbered Air Force commander was very good at tracking operational concerns and at sending you a spare engine or a new crew if you broke down. He was not good at answering commands from this CINC saying, "Where is my next brigade?" "Where is my next Patriot battery?" They were not equipped to do that. So what General Johnson* did is fuse everything at Headquarters AMC at Scott Air Force Base, Illinois. We still have the 21st and 22nd Air Forces, but now everything is centrally controlled out of Scott Air Force Base. There are no geographical chops anymore. You always get your command and control out of Scott.

Oettinger: But who's in charge of sort of unscrambling air traffic problems? Surely that doesn't get done out of that command center?

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* Gen. H.T. Johnson, USAF, formerly Commander of MAC and AMC.

Lawrence: For air traffic control, there's an international aviation system out there already, and we work within that aviation system.

Oettinger: That's interesting. So the whole assumption here is that this is sort of a peacetime thing.

Lawrence: Peacetime or wartime. Even at the height of Desert Storm, flying down the Mediterranean, we would work with Rome Air Control to get our clearances and to keep our spacing, just like we were El Al or TWA. It's the International Civil Aeronautics Organization, ICAO.

Oettinger: If you don't mind, I may interject another comment, because in discussions of information warfare, this question of disruption or nondisruption, and what happens in terms of using common assets versus having your own, keeps coming up. I think I've made the remark that there are some instances, like the postal traffic in World War I, or some of the war termination ideas under the nuclear scenarios, where the notion that there's much to gain by keeping the thing going because otherwise everybody gets screwed up must be the underlying assumption. Otherwise nobody in his right mind would run something like that. But it's the first instance where I've heard explicitly that there's total reliance on an ongoing collaborative global peacetime thing as part of sort of a contingency plan.

Lawrence: Every time we fly through Greece and Turkey airspace, we still have problems with air traffic control; they won't transmit our information from one center to another. We have to make the transmissions twice.

Oettinger: And civilian airliners don't have to do that?

Lawrence: They do the same thing.

Oettinger: They do the same thing? I'll be damned!

Lawrence: But technology has improved this system, so we're not dependent upon ground-based systems anymore. The aircraft all have inertial navigation systems on them. We also have global positioning satellites, which get us within six feet of wherever we want to be. So in the past, we were slaves to radars down there. We're not slaves to them anymore. If a war comes, we can go wherever we want.

Oettinger: Yes, but you lose track of who the hell else is up there, possibly.

Lawrence: That's why we have AWACS, which will replicate the air traffic control system.

Oettinger: So you do have backup in case the international order of all this breaks down.

Lawrence: If we had a war in Southwest Asia, that part of the world would be designated our area of operations, and we would have an Air Force person in charge of all Air Force assets there: the AFFOR (Air Force Forces Commander). In addition, the JFACC (Joint Forces Air Component Commander) would make sure that all flights would be deconflicted, whether they be civilian, Army, Navy, Marine Corps, or Air Force.

Given this structure, we decided to diffuse central control to achieve better capability (figure 3). We renamed Military Airlift Command the Air Mobility Command. It ceased to be a specified command and now became an air component to the unified command, which is U.S. Transportation Command (USTC, or TRANSCOM). USTC has three forces: a naval component called Sealift Command, Military Traffic and Management Command (MTMC) for the Army, and Air Mobility Command for the Air Force.

Oettinger: So USTC is a unified command, with a CINC?

Lawrence: Yes. The CINC is dual hatted. The commander of AMC is an Air Force general who is also the unified commander. So what General Rutherford does is spend

three days over at the TRANSCOM building and two days at the AMC building. As we were talking about earlier, a lot of stuff in AMC is run by the vice commander, currently Lt. General Tenoso.

The new command and control center is the Tanker Airlift Control Center (TACC), commanded by Brigadier General Wax. It is the central control for all aircraft that fly worldwide. Every mobility crew talks to the TACC. It has three cells: an East cell, a West cell, and an Americas cell. Anything that is in North or South America goes to the Americas cell. Anything that goes off either coast is in the East cell or the West cell, depending on the direction. So all information is tracked in there. For readiness and operations training, we divided the Air Force into two Numbered Air Forces, 15th and 21st, just like we did the old 21st and 22nd.

Global Reach Laydown is provided by one of two 1,000-person organizations called Air Mobility Operations Groups (AMOGs). With downsizing, the whole enroute structure has changed a little bit, and we have gone from 39 locations to 13 locations in the world (figure 4). So, in the future, if we want to plus-up, say, Cairo West, because we want to do another operation in Somalia, we will send up to 1,000 people from one of the AMOGs to assist in command and control, who would then relay back to the TACC. Clear as mud? Have I lost anybody?

Student: Yes. Can I get you, sir, to go back to the previous slide, please (figure 3)? I have two questions. The first one is, why did they dual-hat the USTC commander, who is also the Air Mobility commander?

Lawrence: Because they didn't want to create a new commander. They already had a specified commander. They just made that specified commander a unified commander.

Student: That was just to keep a Navy guy from getting the job.

Lawrence: It's a rotational command, by the way. But that was the decision that was made.

Figure 3
Mobility Organization

13 Key OCONUS Locations
• Locations reduced by 66%
    – 9 AMC contracted sites and 9 locations AMC presence withdrawn
    – Authorizations downsized from 5,287 to under 4,000
    – 6 Airlift Support Groups to 2 Air Mobility Support Groups
    – 20 Squadrons to 13 Air Mobility Support Squadrons
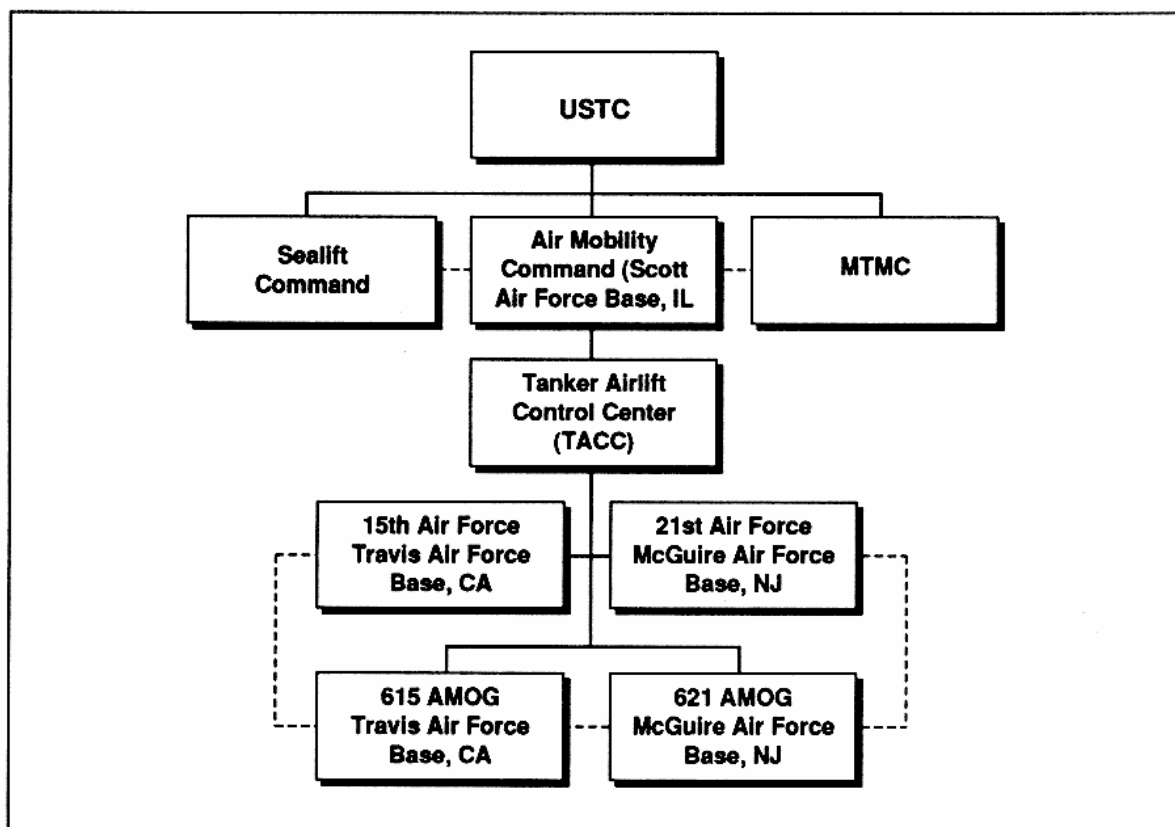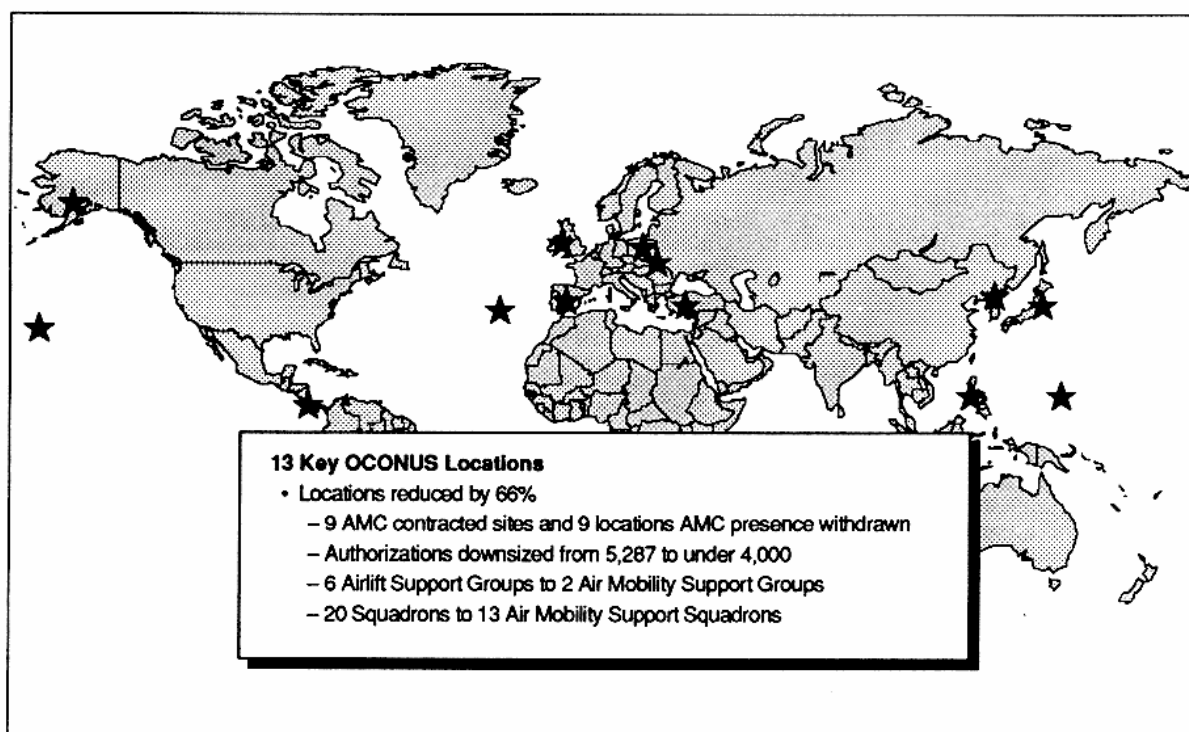
Figure 4
En Route Structure (As of 1 July 1994)

Student: And then, sir, just to make sure, on the chart: under AMC there must be more than just a Tanker Airlift Control Center, right? What other kinds of organizations would be to the left and right of the TACC?

Lawrence: I'll get to that in a second. The TACC is the command and control center. It is the nerve system for the entire command. It is about an 800-person organization. It deals with what we call air mobility tasking orders, which are operation orders for flying, and it has military personnel offices, which are concerned with BOS—that pickup truck with feet on it. Those are the two principal functions. Within the TACC are three cells: the Americas cell, the East cell, and the West cell. So when we did operations into Somalia, we would have the Americas cell gathering up all the Stateside forces and feeding information over to the East cell, which directed us to fly that stuff to Somalia.

Student: Another thing that confused me is that it says "tanker." Is it more than tankers that they control?

Lawrence: Tankers and airlift.

Student: Okay, I've got it.

Lawrence: Last year, all the C-130s—the smaller tactical airlift cargo aircraft—were given back to the old Tactical Air Command, which is now called the Air Combat Command (ACC). In exchange for that, all the tanker aircraft were provided to the old MAC system, the cargo system. So now, AMC is concerned with tanker and airlift aircraft. Tactical airlift aircraft stay within a theater, whereas strategic airlift aircraft fly back and forth between the U.S. and the theater in conflict.

Student: What is an airlift aircraft, sir?

Lawrence: That's a C-5 or C-141 or an OSA (operational support aircraft), which is like a Learjet, a C-21.

Student: Sir, what was the concept behind the AMOG? Did you realize that you'd

have to shut down a lot of infrastructure around the world, or was it that you realized that even with the present structure there were just some overall C^3I problems that called for some contingency group? Which came first, or did they kind of blend together?

Lawrence: It came because of what happened in Somalia. When we revisited Desert Storm, we reorganized the Air Mobility Command to that organization chart that I just showed you (figure 3). That's so we'd have centralized control. We fused all those functions, so now we have a unified commander talking to a geographical warfighting CINC if he has questions about mobility, because that was the shortfall that happened. During Desert Storm, CINCCENT, General Schwarzkopf, wasn't sure whom he should talk to. Should he talk to the numbered Air Force commander or to the MAC commander? He talked to the MAC commander, but operations control was under the numbered Air Force commander. General Johnson said that is incorrect, so he fused it all back to the centralized organization.

We did that. In addition, we downsized after Desert Storm: we went from 39 to 13 organizations (figure 4). In December of 1992, we kicked off Restore Hope, which was humanitarian relief to Somalia, and that's what precipitated building this Global Reach Laydown package, of which the AMOGs are a critical piece.

Student: So it was more than the downsizing; you just couldn't maintain the current capabilities with the downsize?

Lawrence: The AMC commander could not maintain the command and control. He couldn't control the seams. He didn't have the in-transit visibility ...

Student: I suggest another one is that this is sort of an indicator of things to come. The Somalian operation was a pure humanitarian operation, as large as it was, and, basically, there was no war being fought. It was a transportation operation. In the past, in my understanding, a lot of the AMC's bed-down philosophies were that

these airplanes have to live on the ground and it takes a lot of people to support them on the ground. The support, and the support basis, would come from the other side of the Air Force, which is the Air Combat Command, the shooters. Well, there weren't any shooters involved in Somalia, and all of a sudden, "Gee, there's no shooters! We're going to have to learn to support a war that isn't a war." A lot of the impetus, as I understand it, came out of that particular situation.

Lawrence: It was always Central Command's theater. They would make all the choices; however, AMC was commanding all the forces there. Doing that, the command and control would break down, because first, CENTCOM was stationed at MacDill Air Force Base, Florida. So, you had one chain of command taking communications from Somalia to Florida to St. Louis, where the headquarters is for AMC. You had another chain of command that went directly from Somalia to St. Louis. And there was another seam—because we had a staging base at Cairo West, we had European Command (EUCOM) in there too. So we had another chain of command that went from Cairo to Stuttgart to AMC, and all that would funnel back to the JCS at the Pentagon. We said, "Okay, there's something wrong here. We're not managing this well." This is why we came up with this new organization. If you would just bear with me for a couple of minutes, I'll try to run through in a little bit more detail the lessons learned from that.

Student: Sir, while you go through this, probably in the back of your mind ... I've been studying all the JTFs (Joint Task Forces) we've had since 1960, and believe it or not, what you just described was a problem we had during Vietnam—the same thing. I just wanted to let you know that in case you didn't know.

Oettinger: The same problem in that Lebanon-Marine shoot-up. It's a long-standing and interesting one.

Lawrence: In the past, we were always oriented towards the old Cold War paradigm: "We're going to fight the Russians at the Fulda Gap. We're going to fight the North Koreans across the DMZ, and maybe the Chinese somewhere else." We're not in that anymore. We're looking at two MRCs. We don't know where they're going to be; current thinking is maybe Iraq and maybe North Korea. We're also going to do contingencies; we're also going to do humanitarian; we're also going to do peacekeeping. There are always going to be Rwandas. There are always going to be Somalias. There's always going to be earthquake relief. Those are the types of missions we'll be dealing with. How do we handle those, and how do we structure for a war where we've gone from the old paradigm of collective defense, where we and our allies would get together and work against a common enemy, and we all knew who that common enemy was? Now we're into collective security. We know we are all allies, but we just don't know whom we're going to fight and where we're going to fight. So our concern is how we take care of that.

So, we got the tankers on board; that is, we moved those aircraft into the Air Mobility Command, but we also collocated them into the Guard and Reserves, who are citizen soldiers and airmen. This is just to give you a feel for it (figure 5). The stars are the command nodes; the sunbursts are the active units; the ovals are Air National Guard and Air Force Reserve units. You can see where they're all spread out, with the numbers of aircraft involved shown at the bottom of the chart.

So, not only do you have to worry about the external issues—how to meet the customer's needs—you now also have three different chains of command for the forces you own. The Guard works for the governor. The Reserves work for their own numbered Air Force commander, and by title law, they have different command and control activities until they are activated by the President and Congress. We can work with them on an individual person-day basis, but we can't activate them for a contingency. This also does not include the 300 civilian aircraft in the civilian reserve air fleet that we can activate in case of a national emergency (e.g., the 747s from
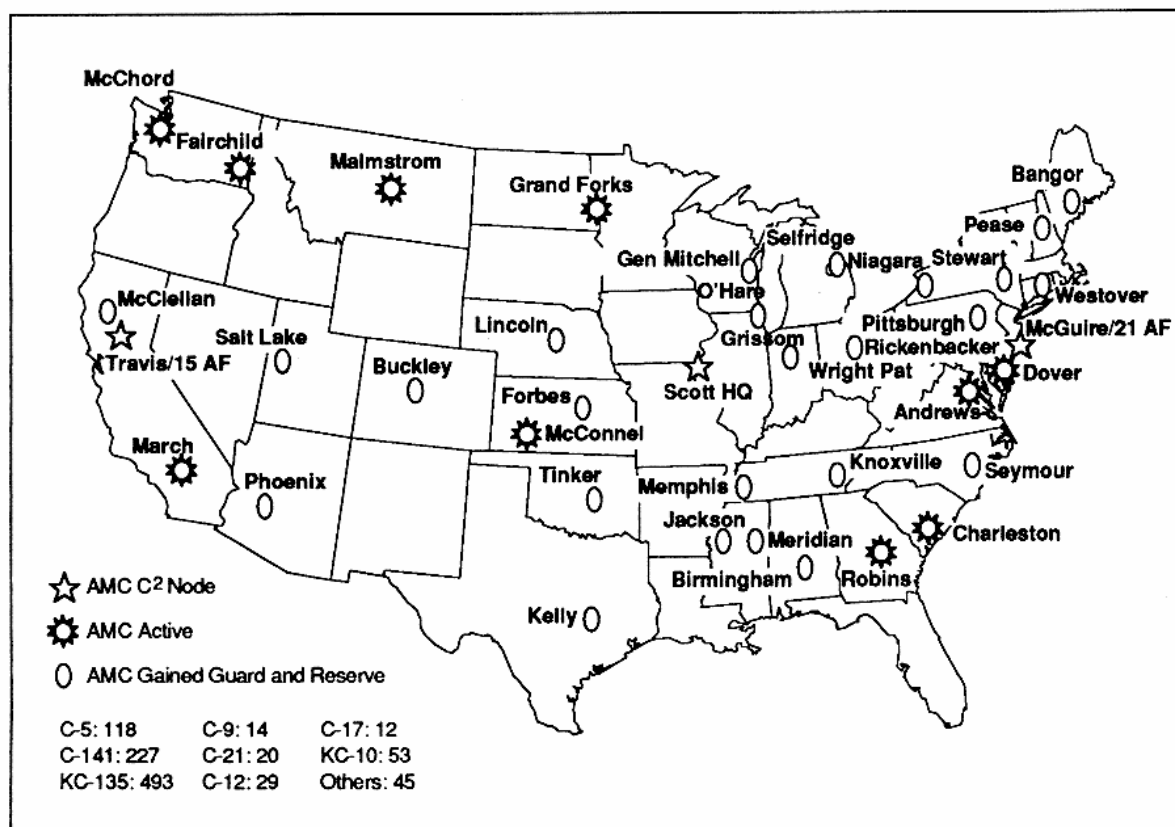
Figure 5
Mobility Forces

Delta, etc.). So these are the Reserve and civilian forces we have to work with.

This has been kind of a long way to build up to the question of why we needed to develop a new Global Reach Laydown approach. Basically, we've changed organizations, we have different types of forces in the command, and we have different types of missions because of the changing world environment. So what we had to do is come up with a Global Reach Laydown system to expand that worldwide en-route system (ERS) that has shrunk with the new world order: to meet the demands of a different organization, a different force size, and different types of missions.

The 615th is one of the two AMOG organizations, and this is what it looks like (figure 6). There are six different squadrons in the AMOG, and basically this is your buffet. If I have an operation to do, I will go to this buffet and say, "What do I

need for my command and control nodes to make these things happen?" "Well, I'll take some combat camera people in; I'll take some aerial support people to offload and onload those boxes; I'll take some maintenance people; and I'll take some operations people to set up that command and control node to communicate back to my central point, the TACC."

Student: Sir, is there anything in that organization that you guys think may be missing and you're kind of pondering about putting in now? The reason I ask that missions and military operations other than war, and they require different capabilities—flexibility. Is that organization sufficiently flexible for that full range of operations, or are there some things that you're trying to figure out? Are there some things, for example, that come from the Reserve component that you're counting on?
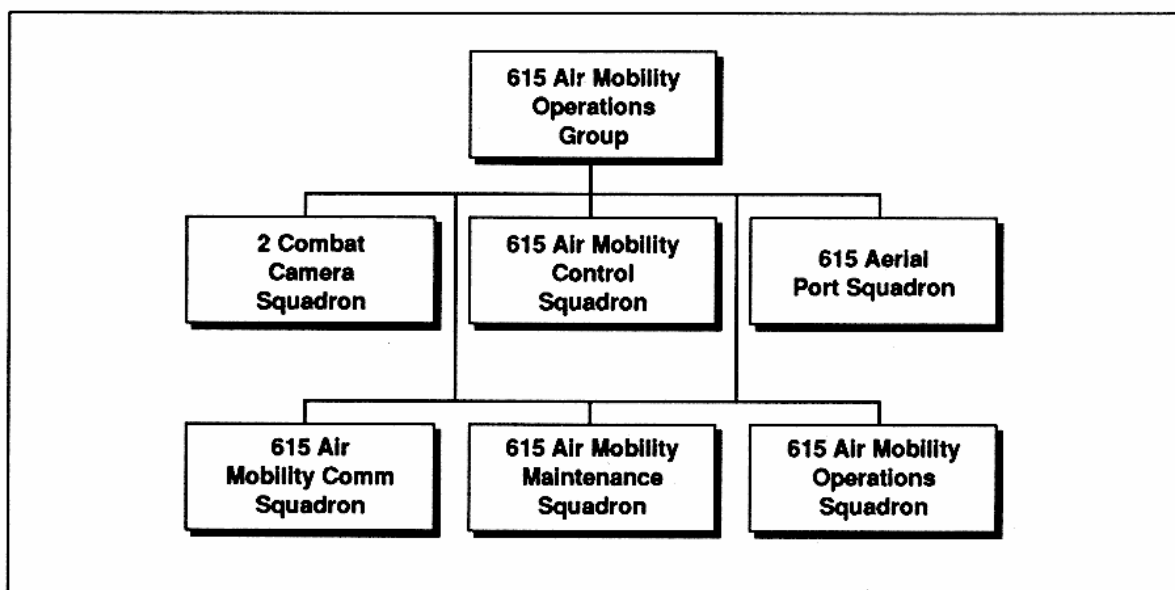
Figure 6

The 615th AMOG

Lawrence: Fortunately, the Air Force is structured a little bit differently than the Army in the fact that this 1,000-person organization at each AMOG is all active duty. It's also backed up with 5,000 people in the Reserve and Guard, with similar specialties. If we have a contingency, we can handle the contingency. If we have a humanitarian mission, we can handle humanitarian. If we have a major regional conflict, we're going to have to activate the Guard and Reserve, just as the Army and the Navy are going to have to do. So what this does is get you that initial look until you decide how deep this war or contingency is going to be. So it will handle you initially.

These AMOGs are only one year old. This July, I'll be giving a first inspection to an AMOG, and I'll talk in a little bit about how we're going to do that.

This (figure 7) will only be up for a second ... trust me! If we get into another operation, TRANSCOM will go to its air component, AMC, and direct its forces through the Tanker Airlift Control Center. It will take people from that buffet of six squadrons out of the AMOG and put in an Air Mobility Element (AME) to manage up to five control elements (that's what TALCE stands for—Tanker Airlift Control

Element) to direct forces in theater. TALCEs will direct and assist the mobility forces at the TALCE-assigned bed-down base that don't chop to the in-theater command, like the C-141s and the C-5s and the tankers that go back and forth between the theaters. Each TALCE then reports to the AME, which, in turn, reports to the TACC for C2. In addition, the TALCEs can support chopped mobility forces, if needed; that is, TALCEs provide the flightline support for those mobility aircraft in theater and C2 for non-chopped mobility forces. AMOGs also provide expertise to the theater air commander's command post (that's what an AOC [Air Operations Center] is—the overall air campaign command post). The tanker cell operation and the airlift coordination center (ALCC) will provide tanker and airlift expertise within the AOC for the theater commander and hopefully make all that happen. Having said all this, in the future, when a theater commander sets up his or her C2, the Global Reach Laydown package will aid C2 and assist in all mobility concerns.

This is what happened during Restore Hope (figure 8). I took command of the group in McGuire. I'd been there about three months, and we already had about

Figure 7
Typical In-Theater Air Organization
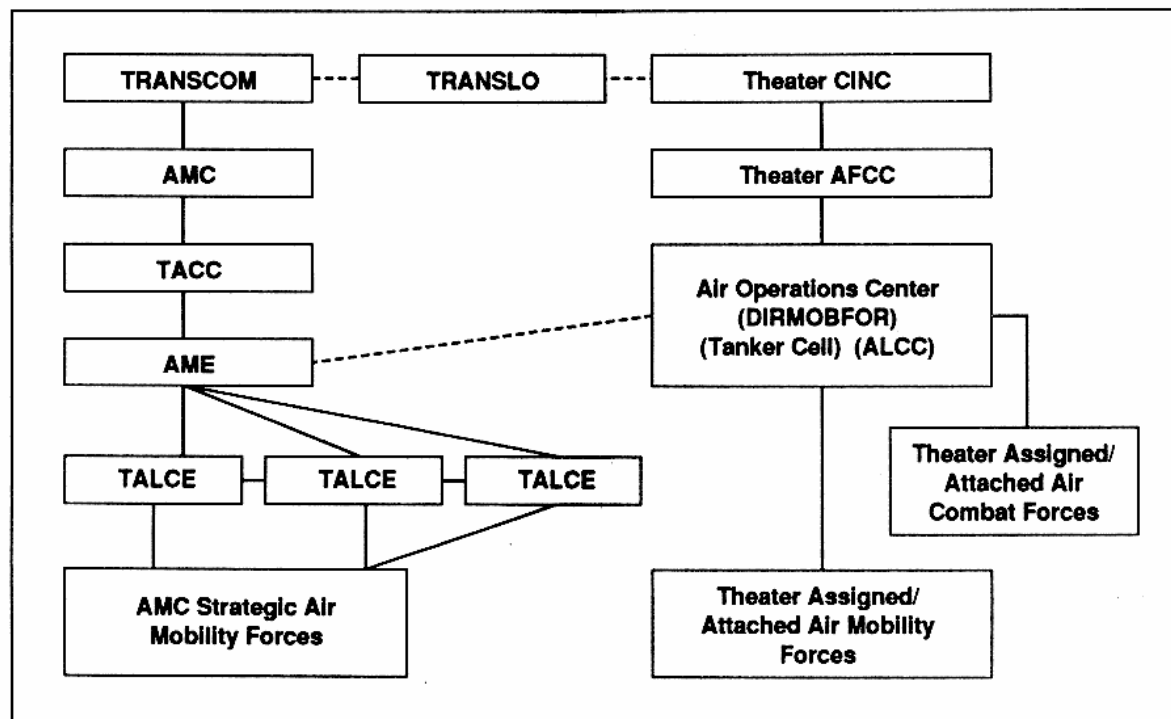
half our forces down doing relief operations for Hurricane Andrew, because of the devastation in Florida. We got the call that the 10th Army Division needed to move to Somalia. The Marines were going to come in ashore, and the Army was going to come in via airlift. As I just showed you, we were down to those 13 fixed OCONUS (outside the contiguous United States) organizations. But in this contingency, we initially had to stage out of Moron, Spain, to go into Mombassa or Nairobi, Kenya. So we deployed these two TALCE organizations to take care of flightline operations: fuel the airplanes, maintain the airplanes; i.e., set up for that Pony Express-in-reverse operation. That would kind of be our corral so that horse can keep moving.

When we were in Spain, we worked for EUCOM. When we were in Africa, we worked for CENTCOM. My deputy subsequently went to Cairo West and set up the stage base there. In Cairo, he had difficulty procuring supplies because, in this CENTCOM operation, he worked in a EUCOM AOR. This is what the AMOGs' Global Reach Laydown package is designed to overcome and why we came up with the

AMOG that you asked about. There are a lot of seams in these operations. How do we get past that, because, from our perspective, we're in a shrunken world enroute environment? We need people to talk, coordinate, and command and control those seams.

Among the lessons learned from Restore Hope, we found that the principal database, the Global Decision Support System (GDSS), which is basically a database that Air Mobility Command uses to track aircraft movement, takeoff and landing, and that type of stuff, had no way of putting tanker information in. We just received the tanker aircraft because of the trade with the C-130s. In Restore Hope, we wanted to establish an air bridge from McGuire all the way into Somalia (i.e., an airlift aircraft capable of flying nonstop to any destination with the aid of tanker aircraft). Airlift aircraft would rendezvous with tanker aircraft somewhere over Lajes, which is in the Azores in the mid-Atlantic, and, unfortunately, sometimes there was no tanker aircraft there, so we'd have to divert and land, or, hopefully, TACC would launch another tanker aircraft quickly
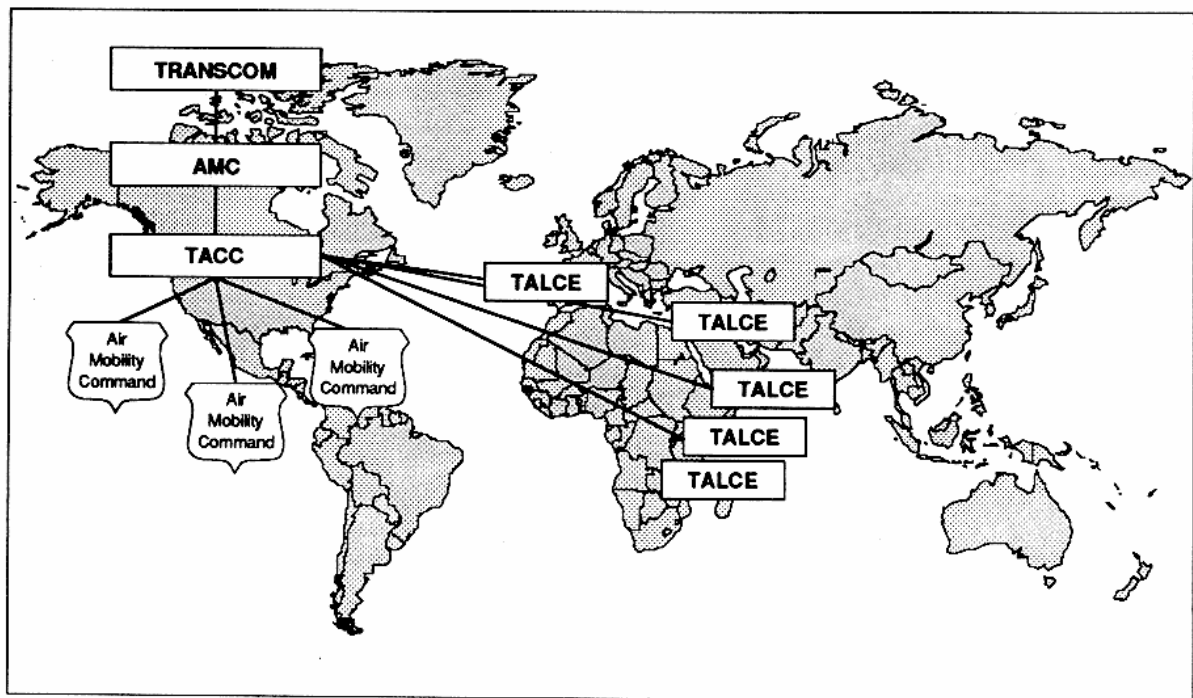
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Figure 8
Restore Hope Scenario

enough so we wouldn't run out of gas. That's one of the lessons learned.

Also, we found out we did not have standard metrics (a Total Quality Management term); basically, we didn't have a measurement tool for saying, "Are we meeting the customer's needs? Are we meeting 10th Army's need to close to that location in Somalia?" Our data said that we were failing to meet the closure rate by 50 percent, yet the divisional commander at 10th Army said that we were ahead of his timetable. Obviously, we're not talking to each other. We're working off different sheets of music. So we did not have the right metrics to capture, "Are we doing a good enough job to satisfy the customer?" That's one of the biggest lessons learned; talk to the customer; find out what he needs and when he needs it.

We also determined we had a problem with local OPCON (operational control). We talked about Cairo West and CENT-COM. At Cairo West we had a shortage of LMRs (land- mobile radios). We just did not have enough hand-held radios for everybody to talk to one another. Not only

that: the radios on hand didn't have the right frequency. It's somewhat similar to the *Liberty* incident or the Lebanon incident.

Student: Sir, I was wondering what the command relationship between AMC and the CINCs was in the sense of deconflicting of tasks, and if there is something else going on somewhere else. Who manages this? The second question is, what about the working relationships with foreign countries as regards the use of their airspace, the air bases, and so on? Is there already something established or do you sometimes have to go from scratch?

Lawrence: In the case of Restore Hope, we had to work from scratch. One of the reasons, to answer your second question first, is host nation support. The United States is very good at bilateral exercises and very sensitive with different countries in the world, so that if something comes up, if we've worked with them before, it's pretty easy to get host national support. It's really easy to get the host nation support in Cairo

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because we've been doing exercises with the Egyptians for 20 years. The same thing is true with the Spaniards and the Italians. This was not the case with one of the places we had to go to in the Restore Hope (Somalia) scenario: Yemen. We had not been working with the Yemenis for a long time, so we had to have our ambassador, with the air attaché, negotiate the agreements for landing right. We had to do the same thing with Ethiopia because we had to use Addis Ababa as a divert base. Ethiopia had since transitioned from a Marxist regime to their present regime, so we negotiated new arrangements. To recap: if we've done bilateral exercises with the nation before, it's usually pretty easy to get host nation support. If we have not, then that's the ambassador's call, and the State Department has the lead on that.

The first question was, "Who negotiates between the different commands?" With the AMC commander and the U.S. TRANSCOM commander being dual hatted, he has the same seat at the table as the CENTCOM commander does, or as the EUCOM commander does. So if they can't reach an agreement, by law they take it to JCS. They take it to the Chairman, General Shalikashvili. He makes all those force authorizations if the two CINCs cannot agree. The CJCS has the final say on what the force allocation is.

Oettinger: Before you go on, you also in the previous stretch talked about metrics with which to measure the command's success. Are you going to say more about that, or is this a good time to ask you to do so?

Lawrence: I wasn't, but I will go into that. We were talking earlier about TQM. That's one of the big cultural changes. Is everybody familiar with TQM, Total Quality Management? Deming and all that stuff?

From my point of view, I've seen a lot of changes in the Air Force structure because of this. Not because of the quality drivel and all that stuff Deming says that doesn't make any sense, like "Don't ever use slogans." But what it has done is push the leadership into letting its people make their own decisions. It's pushed our leadership into telling people what needs to be done, not how to do it. We've empowered the people. What we've seen is that impetus has made for better organizations.

Because of that, we've had a lot of young sharp troops coming up with great ideas. We had a couple of master sergeants and a captain come up with a new plan that says: "Let's build a strawman airflow. We don't care where the contingency is going to be, but we'll have one. We'll say we're going to launch ten planes an hour. We don't care if it's right or wrong; that's a starting point. Say the 10th Division has to do that operation again; we'll say this is what we think it's going to be. Do you think this is right?" That interchange has given us about 85 percent right answers within day one instead of Restore Hope, where it took us three weeks to get that right answer—a published airflow—because there was no canned war plan to pull from when you do a contingency. If you go to Korea, or you go to Europe, you know what forces you're going to take. If you go to Somalia, that's ad hoc. So what these young troops did is build a strawman that could be used anytime a contingency happens. That's what the quality cultural change has done. If your boss is compliance oriented, it's not going to make any difference. You'll have to wait for a new boss. It pushed the leadership the other way.

Student: Sir, are you going to explain how it's seamless now? Because you've got "lessons learned," but I'm always leery about that word "learned," because I want to see changed behavior. Do you know what I mean, sir? Is it seamless now?

Lawrence: No.

Student: So it's not really learned?

Lawrence: It's learned; we just haven't solved it yet. I brought this up, and if we want to, we can go through it. Are you familiar with the Joint Uniform Lessons-Learned System (JULLS)?

Student: I know that big time, believe me.

Lawrence: Basically, it's a database consisting of nine fields that ask, "What are your key words? What are your lessons learned? What discussion? What's your recommended action?" Unfortunately, some of those recommended actions that solve your problems are still open. So we've learned the lesson, and the problem is that every time we do one of these things, we find out half of it is, "Okay, we need to be better at what we know we should be doing." The other half is, "We didn't even think of asking the right questions." If you asked the right question is always the question, and you don't know the right question to ask because you don't know what it is. Have you gone through that yet, Tony?

Oettinger: No, I haven't. Have I plagued you with the unk-unks?

Student: Yes.

Oettinger: I have? Unknown unknowns, okay. So I have. The things you don't know you don't know will come and bite you.

Student: That's a good one.

Lawrence: So those are the lessons learned, and again I need to highlight the point that all these operations were successful, whether Restore Hope or the next two I'll be talking about. What makes them successful is the men and women who are flexible and adaptable enough to overcome these things.

Oettinger: But you also hear what he said. He said you've got to know to ask the right questions. So that means you've got to be in the frame of mind where the questions are important, because the odds of your ever having answers are very slim. But if you don't think in terms of what questions you need to ask, it's hopeless. That's why I'm a little fanatical about the importance of questions.

Lawrence: Yes, and that's the beauty of the AMOG: that these are a group of people who are going to be stationed together for three years and they're going to rotate in and out of this career field. So this "buffet" of people, if you will, will be called upon time and time again to go to different areas of the world. They will develop a corporate expertise that will carry over in that organization. It's going to be a tough organization to be in because they're going to be TDY (temporary duty) about 300 days a year. So they're going to be ridden hard and put away wet, but they're going to be a good organization. They will keep that corporate memory and they will expand it.

Student: Is the AMOG equipped for the worst case—where there's no support structure at all—or is it somewhere in between and you hope to pick up stuff along the way? It seems that there's some balance between "What if there's nothing at all?" and "What if everything is almost perfect?"

Lawrence: It's like we talked about. It's a transitional organization. It will get you through that first two or three weeks. Then if you find that the operation's going to be longer than that, you need to start calling up Reserves and Guards and plussing them up. It's not enough to keep a whole operation. It would not be enough to run a Desert Storm.

Student: I'm thinking more of the equipment side.

Lawrence: They have tents. They have mobile kitchens. They have all the stuff they need to go into a bare base. All they need is the runway. When we went into Cairo West, unfortunately the field had gone into disrepair. It was covered with about four inches of sand, and everything else was gone. At the height of it we had 2,800 people there, at least 300 tents, a full field hospital, the whole works, because as we evolved in that we said, "We need something," and that became the proving ground for this Global Reach Laydown strategy.

So, yes, they are equipped. Each squadron is about 200 people. They're fully deployable with tents and all the equipment they need to sustain them.

This is the Rwandan operation called Support Hope (figure 9), the same type of operation. This time we were leaving from the CONUS, we needed to go to Central Africa, and what we wanted to do is also establish an air bridge using the tankers that the command owned. The ovals represent air refueling orbit points, so that Pony Express-in-reverse could go directly to Rwanda if it had to and it wouldn't have to worry about basing rights if a country en route didn't want us to land. The stars in the lower left-hand side of the diagram are the areas that we worked with internal to Rwanda.

When we did support for Israel during the Yom Kippur War in 1973, we had to fly equal distances throughout the entire Mediterranean with picket ships in the middle to give us TACAN (tactical air navigation) information because we had nothing on board the aircraft. No country wanted to be associated with the U.S. resupply of Israel because of the oil crisis. So now what this air bridge does for you is give you that flexibility to take off from the States and land in the theater you need to go into.

Oettinger: But there were some runways, though?

Lawrence: Yes, sir. Anything over about 5,000 or 6,000 feet is pretty much what we need. We found that the runway in Kismayu, Somalia, was not well built, and after about 200 landings, we tore it up. So just because it exists initially doesn't mean that it's going to stay in existence. We've got to adapt to that.

These are some gee-whiz numbers (figure 10), just to give you a feel for what a relatively small operation Rwanda was. There were over 1,000 missions, and more than 3,000 sorties moving over 10,000 people and 23,000 short tons of cargo. The military aircraft are on the top half, through the C-141; the civilian aircraft are below.

Just to give you a feel for the flying time involved in that type of operation, the lesson we learned here was that recuts (last-minute changes to scheduled missions) were killing us. The users said that they wanted transportation information a little bit differently than what we developed in that

strawman referred to earlier that the young sergeants and captain put together. Well, they got that, they agreed to it, and then they found out that more than 80 percent of the requests were changed within 24 hours of launch. Any time you do that with an airflow, it's like the traffic on Massachusetts Avenue. If you keep stopping and going, it's not going to flow very fast, but if you keep a nice steady rate, then it will flow. This is basically transportation.

Student: Are you talking about requests that came from the theater that changed after they made the initial requests?

Lawrence: That's correct. And you'd expect that when you go into theater and you've got this much suffering, this much misery, you're going to have changing requirements. So the challenge was: "How do you react to that?" even though the recuts were higher than what we normally expect. We normally expect about 35 percent recut. It's just a standard operation. That's what history tells us.

Oettinger: A recut is a change from anticipated traffic pattern to a new traffic pattern?

Lawrence: Yes. In Somalia, it was in the neighborhood of 67 percent. So now we've gone from 67 percent to 54 percent, and now we have the mechanism of the AMOG personnel in place to transmit information to TACC and back to theater. So when it stays within 24 hours, that's a good thing. What you don't want is a request three days out, three days past the delivery time, because now you've got a flow going and you keep that moving.

Student: Sir, would you do me a favor and just explain recut with one more level of detail, because I've been in a position to do this bad thing. What is it exactly?

Lawrence: Let's say my company is scheduled to come in. I'm a company of military police, and my job is to guard the air base at Entebbe. I need eight airplanes to come in with my people and equipment. I get my first load in there (and they're spaced about four hours apart, so it's going
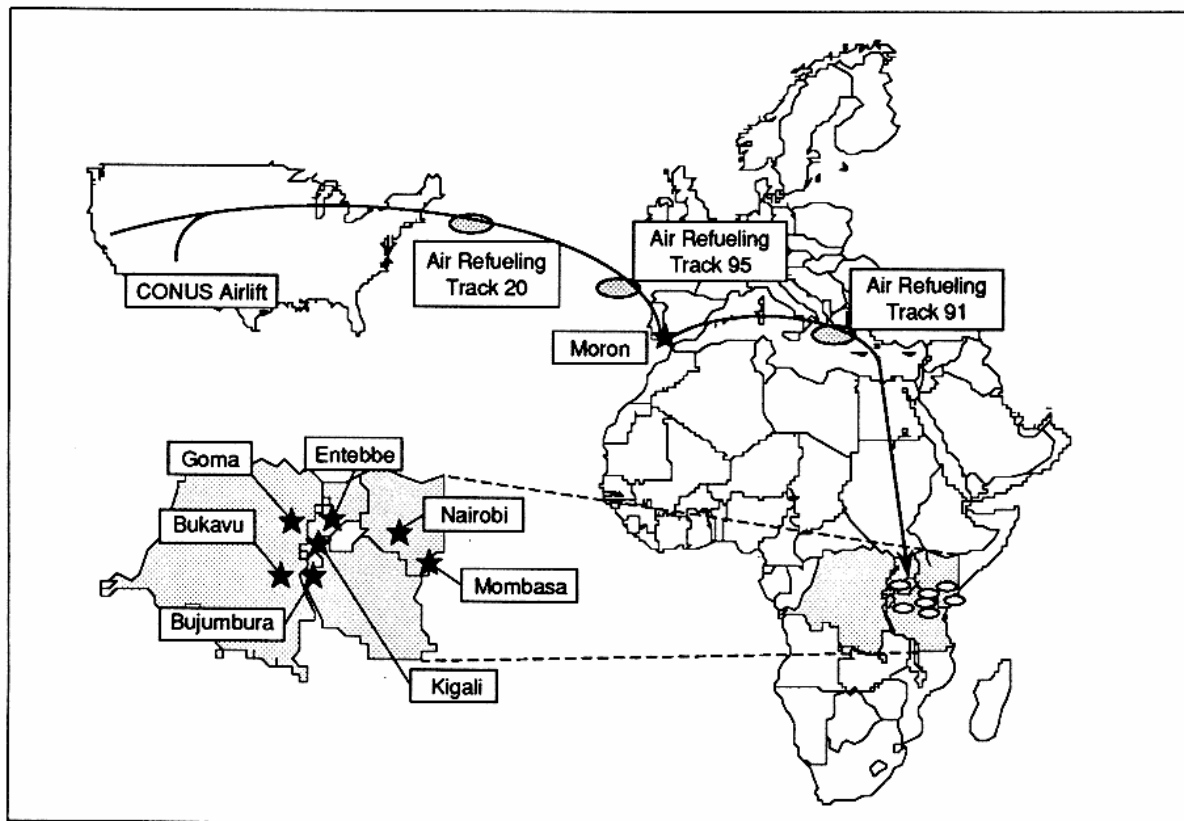
Figure 9

Support Hope Mission Flow

Aircraft Type	Sorties	PAX	CGO (ST)	A/R Sorties	Fly Time
Military Airlift Aircraft (C-5, C-141)	2,527	10,398	19,186	392	12,081
Military Tanker Aircraft (KC-10, KC-135)	543	533	134	—	3,088
Civilian Aircraft (DC-8, B-747, 707, L-100)	354	1	3,590	—	1,670
Totals	3,424	10,972	23,014	392	16,884

PAX = passengers

Figure 10

Support Hope—Rwanda: 22 July – 8 September 1994

to take two days to close the company). I look out there, and I say, "This is a more hostile place than I thought. I was originally going to deploy with hand-held weapons. I've decided, as a commander, that I need crew service weapons. I need mounted machine guns and that type of stuff." So I call back and say, "Recut. Change mission number four from carrying M-16s to crew service weapons."

Student: I think I get this, sir. Let's say he had eight sorties, and he wanted to change sortie four from PAX (passengers) to equipment. Is that one recut?

Lawrence: That's correct.

Student: Got it! I'm trying to understand those percentages. I think I understand.

Oettinger: I guess what puzzles me, then, given your answer, is that some of those recuts make no difference to the traffic flow, whereas others do. So it's a very different concept.

Lawrence: But you see, you still want those people. You still want your 200-man company. You've added a new cargo mission because you wanted equipment. So now it's up from eight sorties to move that company. It takes nine sorties. That water will cascade down and affect the rest of these 1,100 missions.

Another recut would be if the plane takes off and the engine fails. The plane has to turn back and land in Spain. Now you either have to launch another airplane from Stateside or get that airplane fixed, and it's late.

Oettinger: So, in other words, when I'm sitting in an airport and somebody tells me the flight's delayed because of mechanicals, I shouldn't get as upset as I normally do.

Lawrence: We'd be happy to fix it.

Student: On this issue of recuts, what kind of contingency do you have in place? I suppose you must have some kind of contingency, like maybe 10 percent of the flights are not taking off. Do you have

other rules of procedure for recuts, such as level of authority to ask for recuts? How much more extra can you ask for? I suppose this is a natural thing, but I was just wondering what the experience is in regard to this.

Lawrence: Usually if a recut is within a 24-hour period, we ask for flag officer approval. In other words, it's not that we don't trust anybody else, but we just want it elevated to a high enough decision-making level that we're not reacting to frivolous cuts.

Oettinger: And the flag officer is on the operator's side or on your side?

Lawrence: On the user's side. Then, if it's outside 24 hours, we'll negotiate with them. If you had an infinite amount of resources, if you were smart, you'd make every tenth sortie empty to take care of those things you know could happen. However, you don't have that flexibility. When you have 1,100 sorties, and they want them all there today, and you have only 200 airplanes, then you schedule everything you have to maximize and make it as efficient as you can. So it's a question of effectiveness versus efficiency. We're working for efficiency because we have a limited amount of resources, because there is never going to be enough airlift for whatever you want to do.

Student: I was just thinking that, from an operational point of view, it's better not to promise somebody that it will be there tomorrow afternoon, because you know from experience that 35 percent of the flights will be recut. In terms of meeting people's expectations, isn't it better to let them know that what you expect tomorrow is actually going to come the next day, even though we have the capacity to do it tomorrow, so you give him a time window when the supplies will come in? Is that what you do?

Lawrence: Yes, and what we've done in the past, in that eight-sortie example for that company of military police, is that instead of saying that closure time is when the first plane lands, we'll say it's when the last

plane lands. So if the plan breaks down or something gets recut, we can add another airplane into that airflow, inject it in the front end, so instead of doing eight missions that day, we'll do nine missions, but they'll get that no-later-than reporting time and get that closure. So that's how we work around that. We've adjusted the closure time.

It's important for the user to understand that, and that's why it's important to do the exercises we do with the Army, the Navy, the Marines, and the Air Force. The Air Force is the biggest customer of airlift. But they've got to be careful of what they plan on, and what they want to load. Invariably, we find that if we sent a C-141, the units would want to stuff everything on there.

This shows operations for introduction of combat troops into Haiti: Operation Uphold Democracy (figure 11). Basically, the AFFOR and the theater commander are both stationed at Fort Bragg and Pope AFB, which are next door to one another, and that transferred to Port-au-Prince once the troops arrived.

You'll notice the difference between the two operations: that the sorties were about 50 percent more on the number of missions, whereas the passengers were about five times as many with the flying time about the same (figure 12). That's pretty obvious because of the shorter flying distance to Haiti. Again, a lot of different aircraft, including a lot of commercial aircraft, are used in there to haul people.

I won't talk about all the lessons learned from Haiti, just some that I picked out of that big book there just to illustrate some command and control issues. In-transit visibility was not timely and accurate. What we found out is that the weakest link is how you enter the data into the database. If a computer operator didn't enter a "P" or "T" in the appropriate field, this data would not get transmitted and we wouldn't know what's onboard that aircraft. It would get lost. That happens. Then we ask the question, "Where is it? Where are my cameras? Where are my guns? Where is my cargo? Where are my bullets?" We'll find the answer; it's just manpower intensive and it's time consuming.

Oettinger: Yes, but there's a puzzlement there, because presumably that all starts with your customers, if you will. They are the only ones who know what they're shipping. Somewhere in there is an interface with your thing where there's a bill of lading or some darn thing that turns it over to you, at which point it becomes your concern. Can you describe a little bit this question of who knows what's in which box and so on?

Lawrence: What we do is that we, the Air Force, go to every base and train people how to do aircraft loads. When they build an aircraft load, you put what's included onto a cargo manifest. So we would go, say, to Hanscom Air Force Base or to Fort Devens, when they had a Special Forces group out there, and we would teach them, "Okay, to move your unit, you need 22 C-141s. This is how you do the load. This is how you position it so it's all lined up so when we get there, it goes on efficiently."

They also have to tell us what's on it. There are big thick books giving by line-type-code what a jeep is, or what an M-16 is, or a can of fuel is, or a can of beans is. They list all that stuff because they have to weigh it, because you want to make sure the plane is not over gross. So they set that all down properly. That information gets transferred by the user's computer operator placing the data into the system to ensure in-transit visibility We've got the right system out there. One of the problems is training. Another problem is losing the data. That's one of the things we'll be looking at in our next inspection, so we want to make sure we can improve that.

So they put that data in; then they decide they didn't know where things were. How do we find out where it's at? People can find it. It's just manpower intensive. But the real problem is that it took a lot of communication line time. Satellite linkage time is not cheap. It's not an infinite resource. When you're trying to communicate to Port-au-Prince using what satellite time you have, this takes away from other things you want to be doing. So it's not just that you're not sure it's there—you know it's on the dock; it's just trying to track it and keep that information flowing.
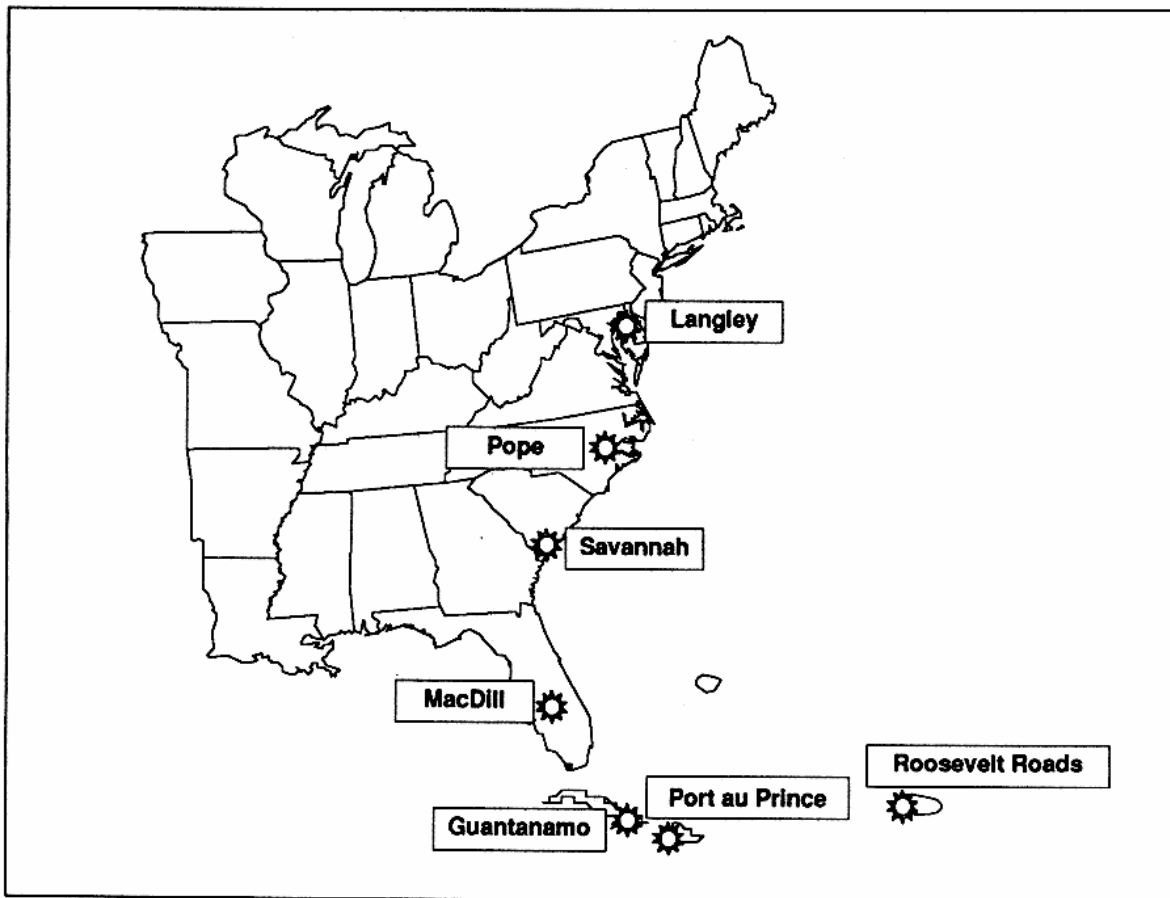
Figure 11

Uphold Democracy

Aircraft Type	Sorties	PAX	CGO (ST)	A/R Sorties	Fly Time
Military Airlift Aircraft (C-5, C-141, C-130, C-9, C-21)	1,583	24,652	21,428	49	13,120
Military Tanker Aircraft (KC-10, KC-135)	92	66	8	—	531
Civilian Aircraft (DC-8, B-747, 757, 727, MD-11, L1011)	130	26,606	1,534	—	1,238
Totals	1,805	51,324	22,967	49	14,889

PAX = passengers

Figure 12

Uphold Democracy—Haiti: 8 September 1994 – 15 March 1995

Student: Are you working then with FedEx or something? Because they're doing this and making money at it, and they're incredibly good. It always blows my mind that you can dial a 1-800 number and read off the code, and they tell you, "The package is on the truck, and it will be in your house in 15 minutes." Sure enough, the guy drives around the corner and tosses it at your door. Are you working with business?

Lawrence: Yes, we are. We were down in Memphis a couple of months ago to see how Federal Express was doing business. The problem we're having—and I'm a little bit out of my field here, so it's just my opinion—is that the interfaces aren't there yet. We have the bar-coding capability FedEx has. We don't have the distribution system at the end. We have a system where we'll pick it up at the chalk line at the Army base, and we will deliver it to the chalk line where we have to offload. What we don't do is that next step: make sure it gets forwarded to the user. In other words, we quit tracking it when it gets to the airbase.

Oettinger: You'll notice, you heard the same thing about imagery. It's a problem.

Lawrence: So what we have to do is think outside of our box. We're so used to working in this box. We need to be more concerned about how that young troop in there enters it in the front end, and we need to make sure that once it lands on that field, it gets forwarded to the ultimate user.

Student: Is it a money problem, or is it a training problem?

Lawrence: Both. And it's a standards problem.

Student: It's an integration problem.

Oettinger: It's also probably a priority problem. Think about it. You heard from the operators and the intel people about their problem in getting capacity, et cetera. My guess is that in a discussion among the services, the fact that you can't do much without your logistical stuff being with

you, or your people being with you, will be low man on the totem pole on the comms priorities and on the budget priorities. Folks forget that you've got to have all the pieces or you don't have anything. Is that a reasonable inference?

Lawrence: It sure is.

Oettinger: And it's the stovepipe thing. Everybody figures their own thing is most important.

Student: But it's also not flashy. People want to buy tanks and guns and airplanes because they're neat, and they fight the war.

Oettinger: Yes, but that's nonsense, right? Because if the tank has no fuel, and the tank has no tank drivers, it's useless. So there are these problems of keeping the various pieces balanced.

Lawrence: That's been an ongoing problem in the Air Mobility Command for a long time, because you're right, it's not sexy. But it's the little things that kind of get you. So, I think if we start thinking outside that box, start expanding our horizons, these are not high-tech requirements either. This is something we can buy off the shelf.

One of the things I think is probably going to help this more than anything else is a contracting change we recently made, where the local contracting purchaser can get his own credit card—I think it's $250,000 or something like that—so you don't have to ask permission. You just go buy commercially available stuff, which gets away from having to find the lowest bidder and all that. Personally, I think that will help.

Oettinger: Although that leads to strange perversions, and again there are balances and pulls and things that need to be reconciled. There were some very bitter U.S. Army folk who were on a U.N. mission in Cambodia, and when they requested some materiel support and so on, the answer that came back from headquarters was, "Buy it in local stores." So it's wonderful to have a

credit card if you are in an operation where you're near someplace where you can buy something. But if you're doing something where there are no stores and there is no local, then, once again, you need a centralized operation that can put together an airlift that can get the stuff to you. So I worry when I hear all this emphasis now on acquiring it from the public sector, private sector, et cetera, or doing it with a credit card. The assumption is that there's a store there, but there may not be a store. You can't forget that either.

Student: It also brings in the problem that if you have units spending their own money out there, a lot of times you will purchase things that are not necessarily essential first and you won't really care at what price. You'll leave the essentials to the end and say, "Uh-oh, I ran out of money. I need gas for the aircraft so we can bomb that city. If you don't give it to me, then we just won't do the mission." How do you get around that? Is that going to be tagged on the commander?

Lawrence: You fire the leadership. That's what we're coming to. Money is very, very tight. We've gone from the old O&M (operations and maintenance) and ASIF (Airlift Support Industrial Fund) ways to basically industrial funds—DBOF-T (Defense Business Operating Fund for Transportation), the whole alphabet soup. But basically, it puts a real pressure on the leadership to make the right decisions.

Oettinger: But also, I think you've raised a point. Aside from generating questions, there's an easy way of doubling every question to another one, which is "What is such-and-such?" and also ask "What are the most likely perversions?" That's always an essential question, and one of the perversions of a buying authority is the kind of thing you mentioned.

Student: That's based on a joke I've heard around the Navy: why do Air Force bases have better quarters? It's because Air Force bases build all the housing first and then run out of money for the runway and say, "Oops, no more money! We need a

runway!" and Congress says, "Okay, here's more money."

Student: I've heard that.

Student: I just wanted to let everybody in on that.

Lawrence: Your point's well taken. My travel budget for my inspectors is $2 million. Do I spend that to buy computers for my people, or do I buy airline tickets to travel to do their inspections? That's how I could pervert the system. So you've got a balancing act. You've got to make leadership accountable. That's the only way you're going to solve that.

Another lesson from Haiti was the redeployment plan. Whenever you start a contingency, you're going to have an exit strategy, not because you need to get the forces out, but because you need to know what sort of sustainment, recycle, rotational policy you want for those people. If you don't, it's a logistics nightmare. Even if it's a wrong answer, say, "Okay, we're going to be there for six months." Then you can start planning that you need to rotate or sustain your resources. If you don't do that, when you get to seven months, you're going to say, "Boy, this equipment is sure getting tired." You haven't figured that problem out, so I think that's a really good lesson learned from this contingency.

The Air Operations Center (AOC) is the command post. The theater command post needs to be augmented by AMC tanker personnel. That's again just a communication problem between two comm systems that didn't work well together.

This is Vigilant Warrior, the resupply to Kuwait (figure 13), when Saddam Hussein brought his forces down and threatened to re-invade Kuwait, and President Clinton decided we were going to make a show of force there from October to December of last year (1994).

Student: Can I ask a question about that? How much easier was it the second time, percentage wise? How much of a difference did it really make?
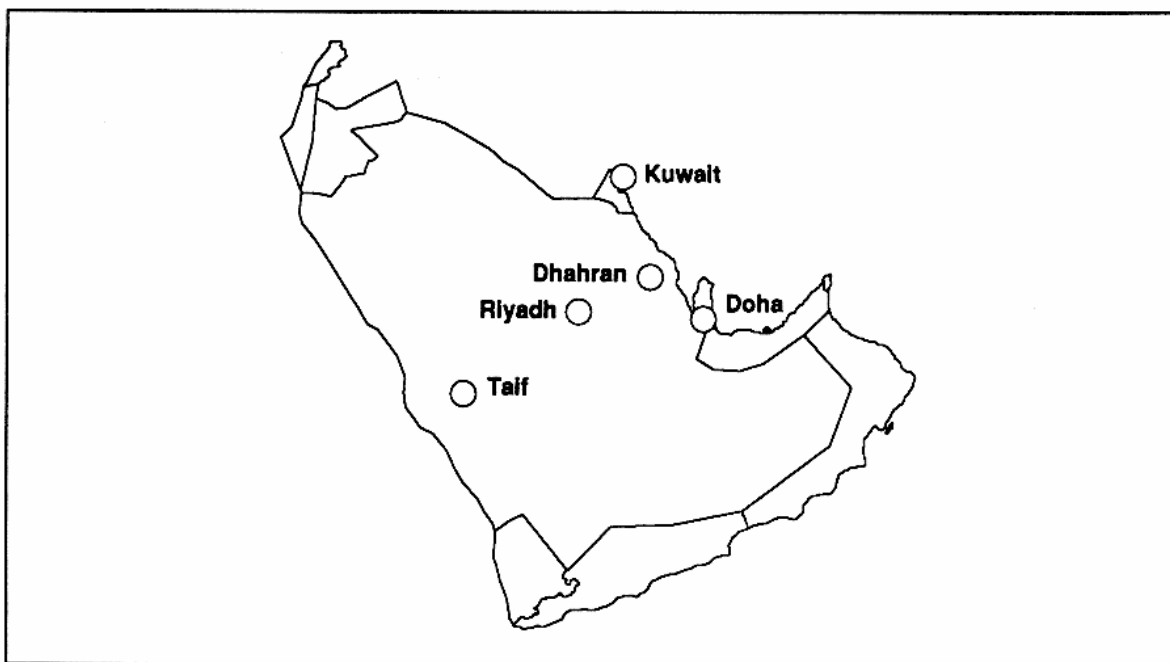
Figure 13
Vigilant Warrior

Lawrence: If you look here (figure 14), this effort is about halfway between the Rwanda and Haiti operations. There are a lot more passengers, a lot less cargo. The cargo is because we prepositioned in that theater. The problem is that when we did Desert Storm, we had 276 C-141s. We now have 198. We were hoping the C-17 was going to replace them. We only got a handful of C-17s here. So the number of airframes available to move this is smaller. The prepositioning is higher. So it's kind of a wash.

Now, say that we had to do it into (I'll pick a country)...say we were going to invade Diego Garcia. There's not a whole lot of prepositioning there for the Army and the Air Force, so that would drive some of these numbers way up. The numbers of aircraft available to make that happen now are a lot smaller. The one thing that kind of ameliorates that a little bit is that now that we own all the tankers, we can have an air bridge and the planes can fly nonstop back and forth. The crew duty day is 24 hours; we can put that crew on and make them fly for 24 hours. You can get pretty much

halfway around the world with a 24-hour crew duty day.

One of the lessons we came up with on Kuwait is that even though we had prepo there, we did not have a support structure for all the bases there. One of the assumptions in any theater is that the owning geographical commander will provide all the base support for inbound forces that come ashore. We found out that was not necessarily the case, because Central Command did not have the resources. So all we had to do is go to that pickup truck with the feet on it, and supply people to do medics, security police, personnel, and that type of stuff. These are unplanned transportation requests which, in fact, impact your flow, impact your delivery time, and put another strain on the system that you hadn't planned. Again, the question was not asked. We're now asking that question.

The operation underlined the need for an AME, which is basically the linkage between that centralized TACC and the forces in theater. I've got one or two slides that can run through what an AME looks like. Let me go through these really quickly.

Aircraft Type	Sorties	PAX	CGO (ST)	A/R Sorties	Fly Time
Military Airlift Aircraft (C-5, C-141, C-130, C-17, C-21)	2,064	7,135	8,559	218	11,066
Military Tanker Aircraft (KC-10, KC-135)	469	327	155	4	2,775
Civilian Aircraft (DC-8, B-747, 707, L-100	427	13,966	783	—	1,947
Totals	2,960	21,101	9,497	222	15,788

PAX = passengers

Figure 14

Vigilant Warrior—Southwest Asia: 8 October – 14 December 1994

This is what the AMOG, that buffet of six squadrons, will give you (figure 15). It will also give you the director of mobility forces, who will be the one who talks mobility to the theater commander (figure 16).

Student: Is he like an advisor to the staff?

Lawrence: You bet. This is what the group's mission is (figure 15). Basically, it's your rapid deployment force.

Oettinger: These have commercial analogues. The director of mobility forces is your customer rep, whom any well-oiled service organization has got to have, except one of the differences is that the civilian ones plan and deploy and train at home, but you then have to have a facility for getting these folks there because you don't know who your customer is going to be. That's an interesting problem that most commercial outfits don't have unless they're contractors to folks like you.

Lawrence: We're kind of the wildcatters out there among the big companies drilling oil wells. Remember the TACC back in St. Louis at command headquarters? The AME is kind of the over-arching structure in theater to support the TACC. These are the people who would work in an AME (figure 17).

You'd have a boss, and basically you would have current ops, intelligence, an aerial port, combat camera, logistics, communications, weather—all the things that you need to interface for good command and control of the mobility piece of that pie. The TALCE, the Tanker Airlift Control Element, is the people who meet the airplane. They block it in, they open the doors, they push the cargo off, they put the gas in, they service the aircraft so it can take off again. So the TALCE takes care of the service station functions on the flightline and, in turn, transmits operational data to the AME. The AME takes care of the communications and control.

Student: Is there some sort of unique airlift-oriented intelligence that would make that required, as opposed to the theater intelligence office that's sitting next door?

Lawrence: Yes, because one of their principal jobs is to debrief the crews when they come in. Mobility aircrews are a great source of information because they're in and out of countries so much.

Oettinger: But that's inbound.

Student: So it's a little piece of the entire intelligence structure, then?

- Plans, organizes, and trains forces to provide one Air Mobility Element and up to five TALCEs for worldwide strategic global reach laydown support to USTRANSCOM-assigned missions.

- Also allows for the further deployment of fully functioning teams containing C^2, aerial port, maintenance, communications, and/or combat camera.

Figure 15

The Air Mobility Operations Group (AMOG)

Senior AMC officer designated by the theater commander and AMC commander

- Directly responsible to the supported commander for control of theater assigned, attached, and based air mobility resources

- Manages tanker and airlift AOR resources

- Provides air mobility expertise to the AFFOR and JFAC

- Can be designated *without* an AME

Figure 16

Director of Mobility Forces (DIRMOBFOR)

Lawrence: That was one of the scenes from this big book here of lessons learned: that we have to work this better between theater intel and the outside intel, if you will, coming in to make sure it's better co-ordinated. Because what do you do when you get that information? You have to transfer it back to St. Louis, and you put out what's called a SPIN, a special instruction, for the crews, and that has to go to the next crew taking off from Texas. They've got to know that there are SA-7s in Rwanda, or wherever you're going, or there's cholera, or ...

Oettinger: That's interesting, because if it works well that takes care of the Air Mobility Command's needs to operate safely and effectively, et cetera. You could also say that some of these guys were there firstest with not necessarily the mostest, but it might also be a very good source of op-erational intelligence. I can just see the next

congressional inquiry that says there was an intelligence failure because the stuff doesn't link up to the tactical intelligence system.

Lawrence: I hope not, but there is a po-tential for that. What we're trying to do in each of these cases is to make the linkage so that this whole transportation model works a little bit better. In the past we had those two geographical areas that were pa-trolled. Now it's fused together with this new organization and we have this traveling road show that goes out there.

Now, one of my jobs in the AMC In-spector General's office is to plan, schedule and execute ORIs (operational readiness inspections), where we look at wings and say, "Are they wartime ready?" (figure 18). This July is an example. We're going to look at how an air mobility wing, which is KC-10s, C-5s, and C-141s out of
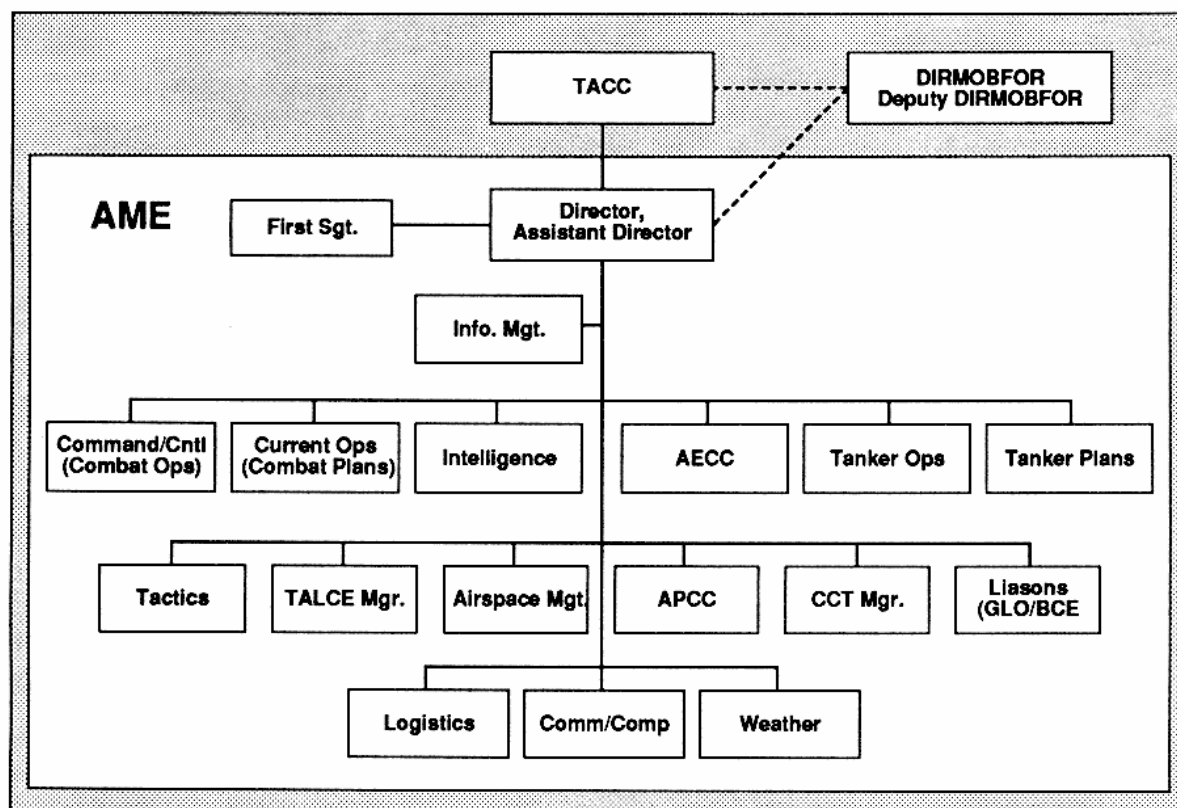
Figure 17
AME Structure

Travis AFB, can marry up with the Air Combat Command composite wing, which is F-15s, F-16s, and B-1s and tankers, and meet in Canada and conduct a Pacific scenario-type conflict. We're also going to check the in-transit visibility for these two units as we move cargo from everybody else. We're also bringing the AWACS in from Tinker AFB. We're bringing a KC-135 tanker wing in from Fairchild AFB. We'll put all this together and see what the interfaces are. One of the principal things we want to look at is how we do in-transit visibility. How do we think out of that box to make sure we know a little bit better where all the cargo is? How do we make sure that the Air Combat Command's command and control system interfaces with the AMC's command and control system? Just by planning, we've already figured out how we can work around it. We borrow some communication operators to make it work. We also want to make sure that all the wings are wartime ready.

If you recall the number of missions for the last three contingencies, they were in the neighborhood of about 1,100. This ORI is planned to be in the neighborhood of about 400 (figure 19). That 1,100 occurred over a few months. This is going to occur in three days. So we're really going to stress the units pretty well to try to get that feedback.

Student: Colonel, is this a first shot at it, to see how well the Air Force does it, and then maybe we're going to try to do this jointly later and throw the fog of the Army and the Navy and all that in there?

Lawrence: Yes, this is the first inspection for the first composite wing and the first mobility wing, which are General McPeak*

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* General Merrill McPeak, USAF, former Air Force Chief of Staff.
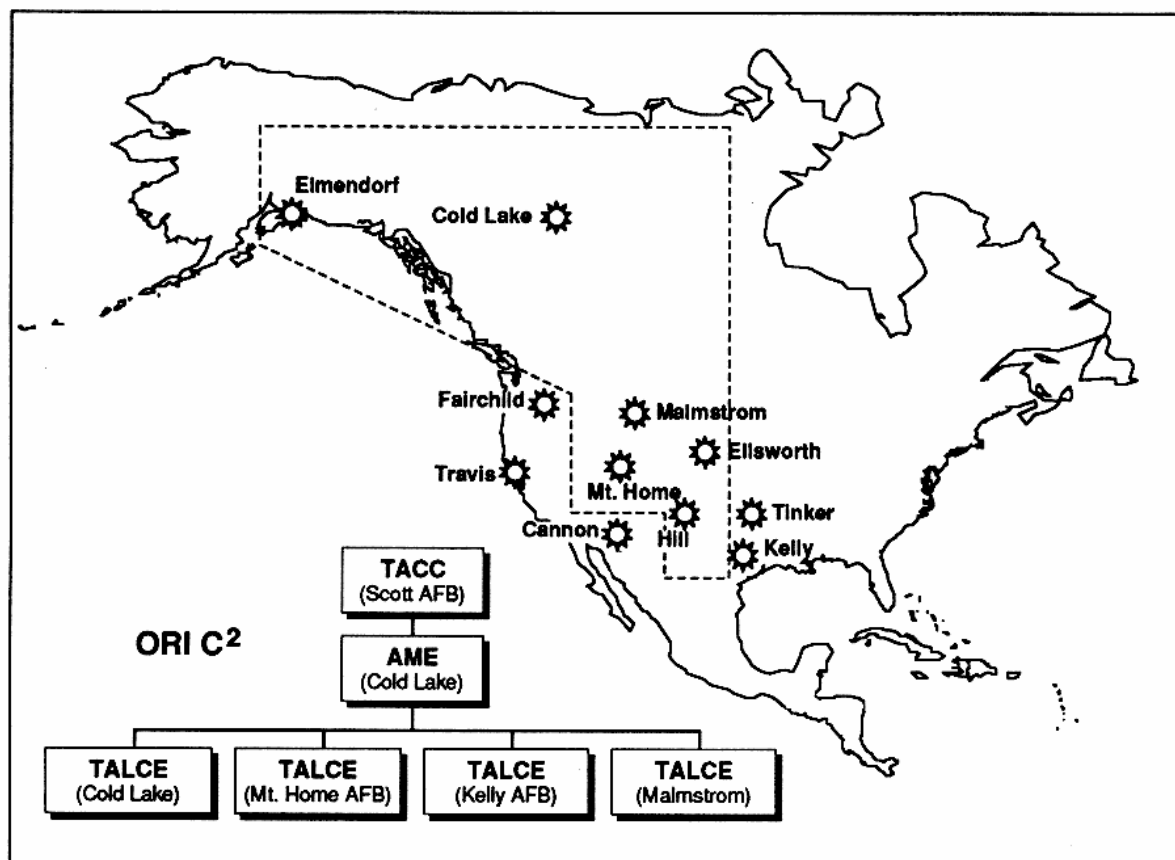
Figure 18
ORI Locations

Aircraft Type	Sorties	PAX	CGO (ST)	A/R Sorties	Fly Time
Military Airlift Aircraft (C-5, C-141)	440	7,503	5,985	—	850
Military Tanker Aircraft (KC-10, KC-135)	207	762	232	157	507
Fighter Aircraft (F-15, F-16, F-111, B-1)	330	—	—	—	—
Totals	977	8,265	6,217	157	1,357

Figure 19
July ORIs

creations—wings with dissimilar types of aircraft. Now, we will also be doing an inspection with the 18th Airborne Corps and an airlift wing from McChord AFB in August 1995. They are going to conduct an airdrop mission at Fort Chafee. We will go down to Fort Chafee and see how they interface with the Army. We're also doing an inspection in May 1995 with three different tanker units and 20,000 personnel—principally Reserve and Guard units—on a Scud-hunting mission. We do about four of these multiunit inspections a year. These are just a few examples.

What I want to get across is not to get hung up on the negative downside of the lessons learned that I've shown you. It's just like in the FMFM-1 (*Fleet Marine Field Manual*). Do you still do that?

Oettinger: This is the Marine Corps doctrine manual. We haven't read it. I didn't assign it this time. I mentioned it only.

Lawrence: It's a great manual that talks about flexibility and adaptability. Again, the one thing that makes all these operations work is dedicated people knowing what their job is and being flexible and adaptable enough, despite knowing that things are not working out perfectly, to make it happen. What we do as a lesson learned is ignore the 95 percent that went well and focus on the 5 percent that didn't go well, so we can make it a little bit easier to ask the right questions.

When we debrief the commander of the Air Mobility Command on the results of this ORI, we will say, "Okay, this unit is wartime ready, and they did good things, and they did bad things." We'll also say, "Oh, by the way, sir, these are some systemic issues." By "systemic" we mean things that the unit has no control over. In other words, for the Travis wing, they have a problem talking to the Air Combat Command wing at Mountain Home because they don't have the right communications. Then the four-star will sit there, and he'll point to somebody at the table of the AMC staff, usually a one- or a two-star officer, and he'll say, "Okay, John or Carol, you got it. You have six months to give me an answer." So now we're taking the answers

away from just stovepiping communication or technology problems to a staff-type organization. If we debrief this so it's a learning situation, then hopefully when we do the next Rwanda or next Restore Hope, the lesson learned that I highlighted here will not exist. It will be a new one. Hopefully, there is always something we can learn from everything.

Oettinger: I guess I would prefer to amend that by saying, in terms of the words of the CINC, not so much "Give me answers," but also "Put in place a process to keep asking the perennial questions." In going back to the question of "Have you exercised this with joint whatever?" what he's pointed out is that even within this fairly limited family, the comms problems are unavoidable. Therefore, somebody who is there to ask questions about that is essential. Why? Because in the meanwhile, the last set of comms got obsolete and inevitably nobody got everything synched with the replacements and so forth, so you have an incompatible system. You're going to have incompatible systems when you have all of this squared away (if you do) and when you bring in the additional elements you mentioned, there will be incompatibility. So somebody might as well be there asking the questions about "This time around, how are we going to address the comms incompatibility problems?" because they will be there. I can think of no instance over 40 years of case studies that we've covered in this seminar where there hasn't been a comms incompatibility. So, instead of saying, "We're going to abolish them," let's put things in place that at least ask the question earlier than later, "How are we going to handle the communications incompatibilities this time around?"

Lawrence: One thing that's the beauty about this JULLS, Joint Universal Lessons-Learned System, is that if you ever get into one of these plans, you can open it up, and you can research it from keywords. For instance, this one says: "Intelligence MISREPs (mission reports) not timely. The observation was that intelligence dissemination was not timely. This is partly due to the lack of understanding of

the urgency of the information by both the operator and intelligence personnel, and to inadequate communication available during the initial weeks of the deployment phase." Then it goes through discussion, and then it goes through lessons learned. It says "A major factor in overcoming this problem would be a substantial upgrade of the TALCE communication equipment. Recommended action is that TALCE should have access to the information, should rewrite their format document, and should include debriefing of the crew when it comes in."

We hope that when this has been closed, it won't be a problem, but by just looking through this, you can see that this will direct you to start asking those right questions again. These are great sources of documents to help you ask the right questions. Look at the old lessons learned, because everything that will come up will be a variation of all these old lessons learned.

Student: Taking the coordination thing one step further, if you use civilian assets to transport troops or equipment, do you just let them alone to use their own systems to solve in-transit visibility problems? Or do you use your system and superimpose it on them? Which is better?

Lawrence: Ours, because if you're TWA, they're probably only good for about 12 different hubs. They're good from St. Louis to Paris, or St. Louis to London. There are not a whole lot of civilian airlines that are good to Rwanda. So they don't have the infrastructure there to support that.

Student: So, when passengers board the aircraft, the commercial airline company is good at checking them off. Do you use their system initially, and then just kind of absorb that information? Or do you start from scratch and use your own system?

Lawrence: We don't start from scratch, because we exercise the Civilian Reserve Air Fleet (CRAF) daily. In other words, we will hire Delta to move a rotation of troops from Texas to Kadena, Japan, (i.e., we will hire that entire airplane). We will teach them how to do the manifest and the way

we need the data, and then we will input it into our system, and we see how that can flow the traffic. We do that in peacetime, so every time we exercise in peacetime, it's pretty much what we should do in wartime. Our wartime missions are the same thing we're doing today, the same thing we did yesterday, the same thing we're doing tomorrow. It's just a different level of intensity. When you're moving cargo, people, or equipment, it doesn't matter if you're doing normal rotations or you're going to Rwanda or going to Desert Storm, although there may be somebody shooting at you. If you're supplying fuel to other aircraft, it doesn't matter if it's peacetime or wartime. What we try to do is look at that daily, refine what we do daily, and that's why TACC has a daily meeting on what went right and what went wrong. They will publish their metrics to the entire command.

Oettinger: You know what's fascinating about this, and well worth thinking about, is that it's the closest I've ever heard (and I want to thank you, Bob) of the Air Force being like the Navy. What a terrible thing to say! But in the sense of there being stuff where wartime/peacetime is the same thing, you have an enormous advantage there of being able to have continuing exercises. The driving of a ship, like the driving of an airplane, in these circumstances as opposed to combat circumstances, gives you this advantage of doing daily what you are supposed to be doing even in emergency situations, which is not true of a large part of the military, where, thank goodness, a lot of the things that happen in wartime don't happen daily, and you have to be elaborate in inventing exercises. But this is a critical element.

Lawrence: As I say, I've been doing this for 20 years. I started in the latter part of Vietnam, and we'd take cargo over. A lot of the questions remain the same, but you see a lot of improvements. I can't stress enough from my point of view the cultural sea changes that occurred because of quality, not because we adopted all that TQM drivel or adhered to the high priests and priestesses of quality. What we've done is we've functionally started with the people

who make things happen, the young troops. They're the best experts in the world on loading an aircraft or typing in a computer field. We ask what they need to improve their job, and force the leadership to adopt that. As we go from wing to wing, looking at people who have adopted that approach, we're really impressed with what they've done.

In a perfect world, if you're doing your quality correctly, you won't have to do these ORIs in the future, because if you're assessing your day-to-day operations, you should be mission capable as well. We're trying to make that linkage, too.

That about summarizes what I said I'd talk about. Would anybody like to talk about any of these lessons learned or different comm systems? I've omitted a lot of stuff because I didn't want to bore you with a lot of vugraphs. I tried to give you a highlight of what our mission was, how we evolved, and what we've learned from the last four contingencies we've gone through, and how we're exercising on maybe a monthly basis with different ORIs or training schemes to incorporate those lessons learned, and to keep asking those right questions.

Student: I was interested in the GDSS—the decision support model that you were talking about. Can you give us a run-through or an example, starting from the request to the execution?

Lawrence: I'll pick on 10th Army because they pick on me for a long time. They did when I worked in SOUTHCOM and they did when I moved to McGuire.

It comes in with a request that they want to move a brigade. 10th Army will take that up to FORSCOM (Army Forces Command), which is its component. From FORSCOM it can go to USACOM (U.S. Atlantic Command). Next, JCS will go to TRANSCOM, which will in turn take it to AMC.

Now this will go through the TRANSCOM J-3 and J-4. It will not go through the general. The request will in turn go to TACC. AMC is divided into two functions now. You've got the headquarters staff, which is concerned with policy

and programs and day-to-day training, and the TACC, the Tanker Airlift Control Center, which is concerned with day-to-day execution. The request comes in from the J-3/J-4, which is the operations and logistics staff offices, and goes into TACC.

TACC is broken up into two worlds: the Air Mobility Tasking Office and the Mission Support Personnel Office. If it's to ask for men and equipment, it will go into the Mission Support Personnel Office. If it's just to schedule an airplane, this request will come into the Air Mobility Tasking Office. We'll just assume that they want to move their brigade. It has nothing to do with Air Force BOS I talked about—(that pickup with feet on it). So we don't have to worry about that. All I need to do is provide them empty airplanes so they can load up their brigade.

So TACC will look at the schedule, and say "Okay, what do I have operating today? Basically, I have about 400 aircraft at work daily, and say 250 are on the road, or I have committed missions, so I have 150 available. I need 50 for training day to day. I've got 50 in maintenance. So I've got 50 available.

Now, that request for the 10th Army will not be the only request that this command will receive on a day-to-day basis. What they've established, back in, I believe it was the 1960s, is a priority system: priority one being presidential support or nuclear support; priority two is exercises; priority three is day-to-day; priority four is rotational-type stuff. We'll say that this is an exercise. So it becomes a priority two. It will get stacked up against all the different priority requests that came in. It makes the cut.

So then we'll go back and say, "Okay, we got your request. We have an airlift for you." If we can't meet it with an organic aircraft, we'll then go to the CRAF and see if we can do it with a 747 or a DC-10 or something. But we go back to the 10th Army and say, "Okay, you've got your flight as requested. It's going to take off on the first at 10 o'clock."

Say the brigade is 1,000 people, so it's probably going to take 10 aircraft, and the tenth aircraft is going to take off at 2300. They're spaced out. So now they know

what the airplane flow is. Now the brigade S-3 will get together and get with different companies and say, "Okay, we got the airlift. Make out your aircraft loads and load it up." They will transmit that information on the air loads, the way they want it, back to TACC.

Then it will go through a second iteration. Some airplanes, because C-141s are getting old, have cracks in the wings and can carry only so much cargo.

Oettinger: Hmmm, thank you.

Lawrence: It's okay.

Oettinger: It's okay?

Lawrence: They haven't lost any wings yet. But airplanes are like any vehicle—they go up and down in cycles. Whether it's a C-5 or a C-141, sometimes they have different restrictions on them. They may have a restriction on them because paint is starting to peel off, and they want them to go at a certain speed.

So you go for the second iteration, everything's confirmed, and you load it. Now the TACC will publish the Air Mobility Tasking Order, and this Air Mobility Tasking Order will go to, let's say, McGuire AFB in New Jersey, which is a C-141 and a KC-10 wing, and say "Okay, you're to launch 10 aircraft to support this." They will set up the launch of the aircraft, and as they launch, they will report back to TACC how it is going. If one of these airplanes breaks, McGuire will do its best out of its own resources to generate another aircraft to make up for what its requirement was. If it cannot, it will go back to TACC and say, "Look, I've exhausted all my possible resources. I can only launch nine." They will go to another base like Charleston AFB, and launch that tenth airplane to meet the customer's needs.

As that's done, then all this data at this point is entered into the GDSS database: Mission #1, take off at 1000, take in 120 troops, destination—let's make it Moron, Spain. In the Remarks section it will say, "The weather at Moron is good; the cargo will include light ammunition," or anything that we need, and the information will also

go to Moron, where the plane will be offloaded, so that people know it's coming and they will get the right equipment there to offload the aircraft.

After the plane is launched, while they're in the air, every hour and 20 minutes, they report back to TACC and tell them the progress that they're making: in other words, did they divert, did they lose an engine, or whatever. That will give them an arrival time so they can tell Moron, the arrival base, what time they will be coming in. Then as they land, and they have no more cargo, Moron will check back with TACC and ask, "Is there any opportune cargo to take back? Is there any requirement to take any cargo back?" TACC will know this from the EUCOM theater because there's also a system at EUCOM. We want to make sure if there's any cargo that needs to go back, we use our resources efficiently. This will all be done in the GDSS database, because now everybody knows that an airplane's flying in and out.

Student: So you actually have software that does all this?

Lawrence: Yes. Basically this is a big database. It's essentially an Excel database.

Student: What was the optimum solution for this particular transportation problem?

Lawrence: To expand the database and add more fields. Remember that one of the problems we had was that there was no field for tanker information. When do you have to orbit at a certain point to offload gas in an airplane? That's been taken care of.

I think we have GDSS and the interface with tanker information pretty well solved. One of the things we haven't solved is that McGuire uses a system called C²IPS (C² Information Processing System) to computerize the greaseboards you see at any command post to cover duty controller scheduling activities. C² IPS should interface with GDSS, and we're not quite there yet. This is a six-phase program and we're still in phase one. We have some software problems. It will get solved eventually.

The other problem we talked about earlier was that the contingency planning

theater model (CTAPS) that Air Combat Command uses is a different comm system, and we have to interface with that as well. So F-15s, F-16s, and AWACS will use the CTAPS data system whereas we use GDSS, and we have to get this interfaced. There are bright people working on it. They'll get that solved.

Oettinger: But at the risk of belaboring the obvious, what underlies this, not only in this system, but in any civilian, military, public, private, and so on system, is, I imagine, the following (and again I'll let Bob comment and either demolish or support the assertion). (1) A good portion of the people who are involved in this are undergoing training. It's the first time they've done it today. (2) The last reorganization occurred a month ago, and everybody is still recovering from that trauma. (3) The equipment in these various places is at different levels of generations of either hardware or software, because their acquisition cycles are not synchronized. So the fact that it works on a daily basis is something of a small miracle. This is true of every airline that we fly, or of this university and its support systems. Again, there's the enormous importance of having smart people asking the right questions, because you cannot stop that process. The price of stopping the process is to have something from 20 years ago that is no longer functional. You're operating dinosaurs. But the price of updating is that this is in perpetual chaos. There's nothing that suggests that for the next decade or two, the pace of this—whether driven by downsizing or by technology or by changes in the global environment—is going to slow down. This is sort of our current lifestyle. Is that a reasonable assessment?

Lawrence: I hate to sound like a technocrat, but part of it, I think, is that the people interface is one of your weaker links, and it's also one of your stronger links. What you need to do is where it's a weaker part of your link, you want to make that less manpower intensive. That's like bar-code reading for your cargo versus hand-writing it. Those types of changes will improve this process. The improvements that have come

to this office involve asking questions: "Does this report make sense? Didn't they just deploy last month? Why are they doing this again? Where are they on the red, green, or flying cycle, training cycle?"

Smart people in different command-making nodes is where the system's going to work, and it's always going to be in a state of flux. But if a system becomes grooved in, if you burn it in like you burn in a computer, it becomes easier. So if you burn the system in, and get rid of the menial manpower-intensive things, and you keep open ears with a questioning mind, that's how you keep things in balance. There is no holy grail here. It's just like dominating the information warfare. You're never going to get there. It's a laudable goal, but don't get hung up. You've got to find the right balance. You don't want to pour all your resources in here and not have any airplanes that can fly because their wings are falling off.

Student: Yours is not the only presentation where we've seen that, when we start talking about problems and lessons learned, the punch line comes down to "We have communications inconsistencies, noninteroperabilities." How much of that, from your standpoint (and I'm a communications guy, so I speak from having been kicked on a lot of these things, too), is bad systems as opposed to bad command and control and bad organizations? It seems to me that the communications systems that we put together reflect the command and control, reflect the organizations, and that maybe when we have bad organizations or bad command and control processes as underlying problems, the symptoms are that the comm systems won't talk to one another. I guess I'm leading you to say, "Yes, that's fine," but, from your perspective, is that a symptom, or is that a problem when these comm systems won't talk to one another?

Lawrence: I'll take that in-between answer. I'm a firm believer that everybody wants to do a great job, and they're striving to do a great job. I'm a firm believer that everybody wants to buy the right hardware, and they're buying it for the right reason,

so that all these comm systems that we bought were bought for the right reasons. These were bought for fighting the Russians at the Fulda Gap.

What has changed is the environment and how we employ these different comm systems, and how we employ these different people. I think that's where the flux and the chaos will occur, because we have to adapt to changing systems. Nothing stays static. So you do the best you can for what you think is the right answer. What bites you is that you end up doing something you didn't think you would do. Who would have thought four years ago we would introduce forces into Haiti, or take care of a massacre situation in Rwanda, or humanitarian relief in Somalia? Those are the types of things where, okay, we're going to do them, but when we pull it off the shelf, we find out it didn't work. If we were going to go fight in Europe or we were going to fight the North Koreans, all these systems would have worked pretty well, because we practiced it, we were in that collective defense mode where we had a common enemy, and everybody was focused on that. So we go to this collective security environment where there is no common threat. Now we're capability based. We have to broaden our horizons, think outside the box: "Given these different systems, how many different ways can I think that I may need them, and how many different ways do I think do I need to latch them up to make them work well? If they can't latch up with the systems, what do I need to buy?" Is that a kind of roundabout answer?

Student: If we can just get those darn North Koreans to attack, then it would make all the comm systems look good.

Lawrence: But I think that, for all the downside about peacekeeping operations, that's been a real watershed of learning how to do combined operations.

Student: ... because there's such a wide range of things that can happen.

Lawrence: So the next time we do a Rwanda, it's going to go a lot better than it did this time.

Oettinger: Yes, well, assuming that it's a Rwanda. Part of the element of these things, whether it's Somalia or Rwanda and so on, is that they have occurred in what otherwise has been an immaculate and unperturbed environment. So in that respect, they've been rather favorable environments. If the next one occurs in a situation where there is a deliberate disruption of all of the various systems that this relies on, then it could be very different. There's no end to surprises. The supply of surprises is unending, and I'm not advocating sloth or something, because the assumption that you're making—that everybody is of good will and competent and so forth—doesn't come easily. When somebody has to work at making sure that the military, or this university, or the XYZ bank, is indeed full of people of good will, well trained and so on, that takes a tremendous amount of effort. My starting point on all the comments I make in the seminar is that where you are, you assume everybody is of good will and competent and so on. Now, what are the other things you need to look at? There remains that catalogue of things that will turn around and bite you, some of which are knowable in advance by virtue of exploiting, as Bob suggests, things like these lessons learned, not as, "Oh, they did it, and it will never happen again," but as a gold mine of recurrent specifics that have a generic character to them because they're rooted in change, human foibles, et cetera. Those are at least unknowns that you can ask questions about. I have no recipe for helping with the unknown unknowns.

Lawrence: You brought up host nation support earlier. All the bilateral exercises that we did when I was in SOUTHCOM, or what we do now with the Army and the Navy, are invaluable. Invariably you'll get another book full of lessons learned, because we have new people and new ways of thinking.

Oettinger: There's the other thing you've brought to us. I have nowhere in the record

of this seminar an equivalent of Bob's bringing a catalog of detailed lessons learned, and not saying "This is ancient history," but "This is an operating document that I use in order to help me improve my operations." I've never heard this in this classroom before. I really appreciate your bringing that outlook on it, because there are a lot of folks who do their lessons learned, but they don't exploit them in the way that Bob has suggested here today.

Lawrence: For this ORI in Canada, one of the things we're going to do is evaluate the AMOG for the first time. We're going to assess the combat readiness of the AMOG out of Travis AFB. We went to this book, and we looked at the lessons learned. The old way we did inspections is that we appeared without notice. We just used to come out of the clear blue and surprise everybody and we'd have a little checklist to make sure you did everything. Today what we do is more results oriented. They kind of know what we're going to do, and if they're pretty smart, they know exactly what we're going to do, but they won't know the intensity, and they won't know when the exercise injects for chemical warfare are going to occur, or bad food, or whatever. So we can evaluate them, and it's results oriented. The beauty of it is to get more lessons learned and see how the inspected organizations adapt and how they hitch together, because the first 24 hours is critical for any group of people or any organizations coming together. That's where you're going to make or break your mission. Then it's flexibility and adaptability.

Student: How much priority does the logistics take? For example, if a battle occurs in some place and you have to send your tanker aircraft near that battle site, and you only have a limited number of airplanes, would you put your first-ranked pilots and airplanes into protecting this tanker aircraft, for example, or would you just put them into the actual battle and bring your second-ranked pilots over too?

Lawrence: That's a trade-off These are assets that you want to use over and over again. As I said, that director of mobility

forces—the customer rep, as Tony said—would make his input to the theater. That's a theater commander's call. If he wants to commit those forces and they get chewed up and lost, so be it.

Oettinger: What you're saying is that it's entirely somebody else's judgment, because it's the Air Force component commander in the area of battle who makes the decision, "Do I protect my supply lines or do I protect something else, or do I put all my pilots on attacking the enemy and let the logistics folks fend for themselves?" We haven't really had a fighter-type Air Force person here who could address that question more specifically.

Student: The Air Force doctrine would say: first, control the airspace. So the very first thing that the classically schooled Air Force warfighter would do is make sure there are no enemy planes around, which makes it tough for those tanker guys because you also need the tankers to refuel the airplanes that are controlling the airspace. It could get ugly early on.

Lawrence: In Desert Storm there were tanker orbits over Baghdad. You assess the threat. You'll see a lot of strategic assets like cargo aircraft will not be chopped to a theater commander, because we don't want him to be making that decision. They may be supplying Desert Storm one day, but have to go to Korea the next day. So it's across CINCdoms, but if they're chopped to a theater, that's a local air commander's call.

Student: Is the C-17 "GO" for the future, and is there something beyond that? I guess what I'm saying is: based on where the C-17 is, do you think we need more prepositioned stuff to leave a good balance based on 10 or 20 years down the road?

Lawrence: Prepo is good if you know where the war is going to be.

Student: Right, but given our best guess, obviously you can't preposition too much, and you don't want it to waste ...

Lawrence: I think in a downsizing world that we're going to have to be like a lot of manufacturers, and have just-in-time equipment and just-in-time maintenance, and you can't do that with prepo, because it's a big investment up front to duplicate a bunch of tanks in-theater and a bunch of tanks at home so people can train on them. On the C-17 question, we have agreed to buy 40. That decision will be made in November 1995. If McDonnell Douglas is on speed according to the Air Force, then we will buy up to 120. If not, there's talk about buying 747 equivalents or DC-10 equivalents or some commercial variety to make the difference.

My personal opinion is that you'd make a big mistake assuming a civilian airliner is the same thing as a cargo liner, because you don't jump out of 747s. You don't airdrop out of 747s. You don't fly at 300 feet in a 747 to avoid radar coverage. You don't air-refuel a 747. There are a lot of military aspects to a cargo airplane that are not transferable to a 747. That's personal opinion. But a friend of mine is a C-17 test pilot and he thinks it's a great airplane. McDonnell Douglas has made some mistakes, and they're being held accountable. If it's a good airplane, we'll buy it. If it's not, we won't. We'll work the best compromise we can for that.

The C-141s have to be replaced. They've got cracks in the wings. They were designed for 25,000 hours initially. Now they've got 35,000 hours, going on 40,000 hours. These are tired old airplanes. Whatever money you save is not going to be worth losing a crew and passengers on board. So if the C-17 doesn't get bought, I'm sure we'll buy some commercial alternative to fill the short-term gap, and then start to look at the C-17+ to make a cargo airplane.

Oettinger: Bob's response to that in terms of pre-positioning versus just-in-time and so on brings to mind a contribution at the very first session of this seminar by a man named Pete Wolgast, who worked for Exxon, on the impact of rerouting tankers during the oil crisis of 1973.* You might ponder that because if you think about pre-1973, a lot of oil reserves were in the ground, on the ground, in tanks and so on, locally inventoried. That started getting drawn down with some saving in inventory costs, and you had your inventory mostly on the high seas. Part of what softened the crisis in 1973 was that there was a lot of inventory on the high seas, which meant that juggling and rerouting tankers could essentially defeat the embargo.

Today, with supertankers and much faster transit, you have much less of a floating inventory, and an oil crisis today would look very different from what it was in 1973. So when one talks about just-in-time inventories, et cetera, you are not only manipulating current operating costs, you are also, in fact, changing in a radical way the dynamics of the system, whether it's oil supply or airplane capacity or fighting supplies of guns or whatever you might have, and that's something else to keep in mind. You might want, if that subject interests you, to look at that 1980 piece by Wolgast as sort of one datum on something that's a much larger subject which we don't have time to deal with here.

Sir, we thank you and offer you this small token of our large gratitude. It's good to have you back.

Lawrence: Thank you.

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* A.K. Wolgast, "Oil Crisis Management," in *Seminar on Command, Control, Communications and Intelligence, Guest Presentations, Spring 1980.* Program on Information Resources Policy, Harvard University, Cambridge, MA, December 1980.