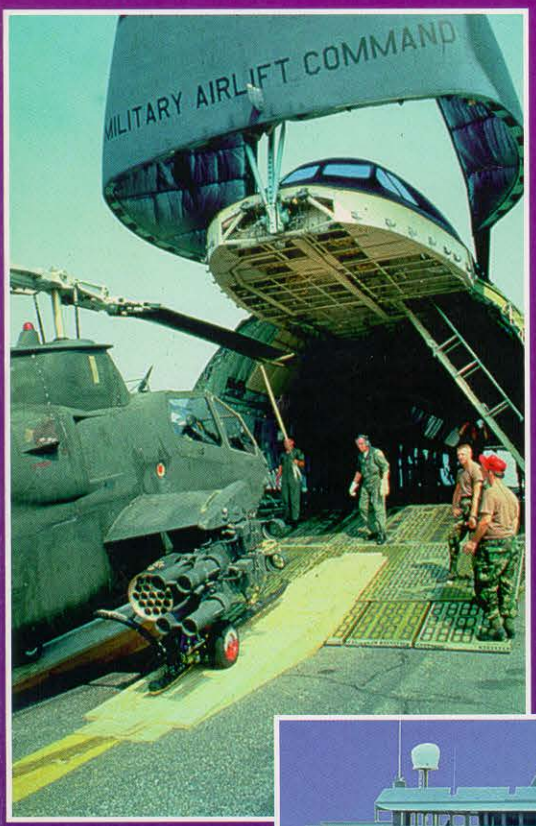
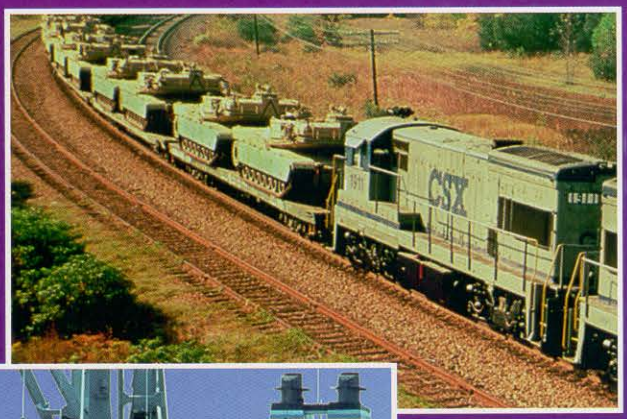
SO MANY, SO MUCH, SO FAR, SO FAST





United States Transportation Command and Strategic Deployment for Operation Desert Shield / Desert Storm

So Many, So Much, So Far, So Fast

United States Transportation Command
and
Strategic Deployment for Operation
Desert Shield/Desert Storm

James K. Matthews
Cora J. Holt

Joint History Office
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and
Research Center
United States Transportation Command

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THE CHAIRMAN, JOINT CHIEFS OF STAFF
WASHINGTON, D.C. 20318

FOREWORD

Strategic mobility, the capability to transport military forces rapidly across intercontinental distances into an operational theater, lies at the heart of US military strategy. Nowhere has the importance of strategic mobility been more evident than in Operation Desert Shield/Desert Storm, the military response to the Iraqi seizure of Kuwait that began in August 1990 and ended in March 1991.

This study presents a detailed analysis of how the Defense Transportation System (DTS)--the United States Transportation Command, its service components, and the civilian transportation industry--provided the strategic mobility that enabled the United States and its allies to assemble an overwhelming military force to defeat Iraq and free Kuwait. It is also a tribute to the hard work and dedication of the military and civilian personnel who ran the DTS during the operation.

This volume is the first major history of a joint operation to be published by the Joint History Office and supports the efforts of the Joint Chiefs of Staff to promote a greater understanding of the joint system. I recommend it to military planners, operators, and logisticians, as well as to readers interested in joint and combined operations.

JOHN M. SHALIKASHVILI
Chairman
of the Joint Chiefs of Staff

THE AUTHORS

Dr. James K. Matthews is the Director of the United States Transportation Command Research Center and serves as Special Staff Assistant to the command's senior staff. In his 17 years of government service, he has worked as a staff historian at Headquarters Strategic Air Command and Headquarters Air Force Communications Command. More recently, he served as the Command Historian for the Military Airlift Command and the United States Transportation Command. He received his doctorate in history in 1981 from the University of California, Santa Barbara.

Cora J. Holt is the United States Transportation Command Freedom of Information and Privacy Act Officer. In her 25 years of government service, she has served with the Department of Agriculture, the Air Force's 3504th Recruiting Group, and at the Headquarters Air Force Communications Command History Office. Previous to her current position, she was the Writer/Editor in the United States Transportation Command Research Center. She received her bachelor of science degree in 1986 from Park College, Parkville, Missouri.

PREFACE

So Many, So Much, So Far, So Fast is based on Volume I of the United States Transportation Command's (USTRANSCOM's) 1990 Annual History titled "Desert Shield/Desert Storm, 7 August 1990-10 March 1991."

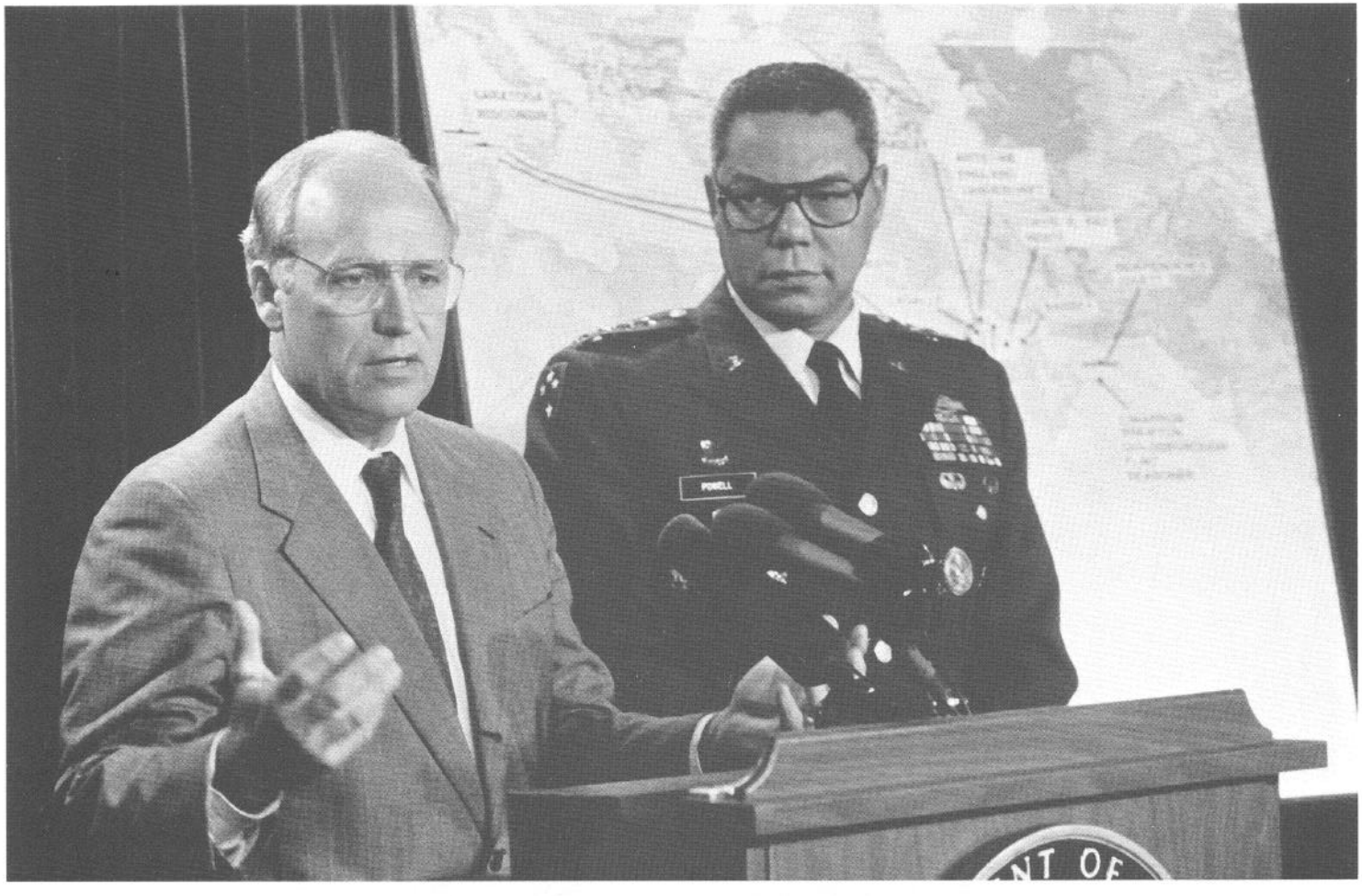
This updated version differs greatly from the earlier one. Chapters I, II, III, VII, and the Conclusion have been completely rewritten and new material incorporated into the text. Sections added include: "Chain of Command" and "Intransit Visibility" in Chapter II; "KC-10 Extender," "Allied Support of US Airlift," "Mail, Gifts, and Channel Airlift," "Refugee Evacuation, Patriot Missile Deployment to Israel, and US Airlift Support for Allies," "Commercial Airlift Insurance Coverage," and "Airlift Sustainment Cargo Backlog" in Chapter III; "Delivery of Petroleum Products," "Foreign Flag Balkers," and "Desert Storm Force Closures" in Chapter IV; and "Reliability, Safety, and Labor" in Chapter V. Additionally, we have added a dozen new tables to the narrative and moved numerous former appendices into the text. Throughout the work, we have integrated reviewer comments, materials from recent research, and interviews, including an oral history with Air Force General Hansford T. Johnson, USTRANSCOM's Commander in Chief during Desert Shield/Desert Storm. Documents cited in chapter endnotes are located in the command's archives.

Our assistants deserve special mention for their effort on this project. Much of the credit for our extensive Desert Shield/Desert Storm document collection is due to Naval Reserve Captain Thomas C. Soraghan who augmented the USTRANSCOM History Office during the operation. Mr. Kevin D. Safford, our summer hire, used his computer wizardry to convert appendices from our outdated software to a newer application. Likewise, we are grateful to our office co-worker Lynnette E. Percival for her data automation and editing expertise. Air Force Reserve Colonel Leslie F. O'Neal, Naval Reserve Captains Robert W. Scott and E. Paul Skoropowski, and Naval Reserve Commanders John Whiteley and Mark D. Hagen made substantive editorial contributions to the document. We are especially indebted to our general editors Margaret J. Nigra, from the USTRANSCOM Research Center, and Air Force Lieutenant Colonel Juliette C. Finkenauer, from the Joint History Office, for preparing the manuscript for publication. Most importantly, our thanks to the many USTRANSCOM troops who supported the work of their historians during the war and after. If they are pleased with our effort, we consider it a success.

Color Image, 12342 Conway Road, Creve Coeur, Missouri, 61341, designed and produced the maps, softbound cover, and dust cover.

JAMES K. MATTHEWS CORA J. HOLT

General Hansford T. Johnson, USAF
Commander in Chief, United States Transportation Command
and
Commander in Chief, Military Airlift Command
September 1989-August 1992



Secretary of Defense Richard B. "Dick" Cheney
and
Chairman of the Joint Chiefs of Staff General Colin L. Powell, USA

General H. Norman Schwarzkopf, USA
Commander in Chief,
United States Central Command
November 1988-August 1991

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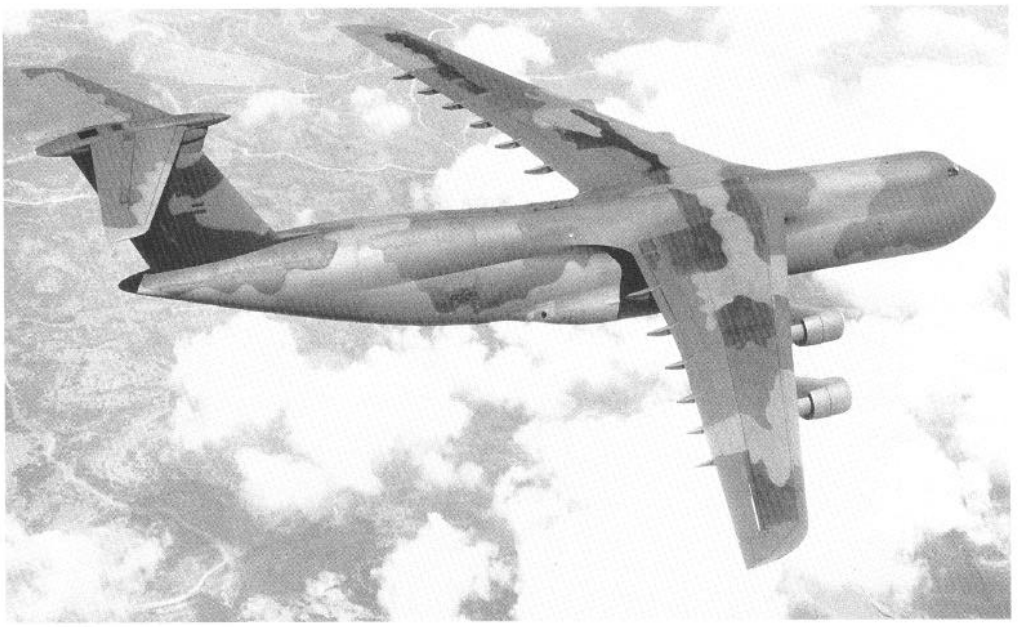
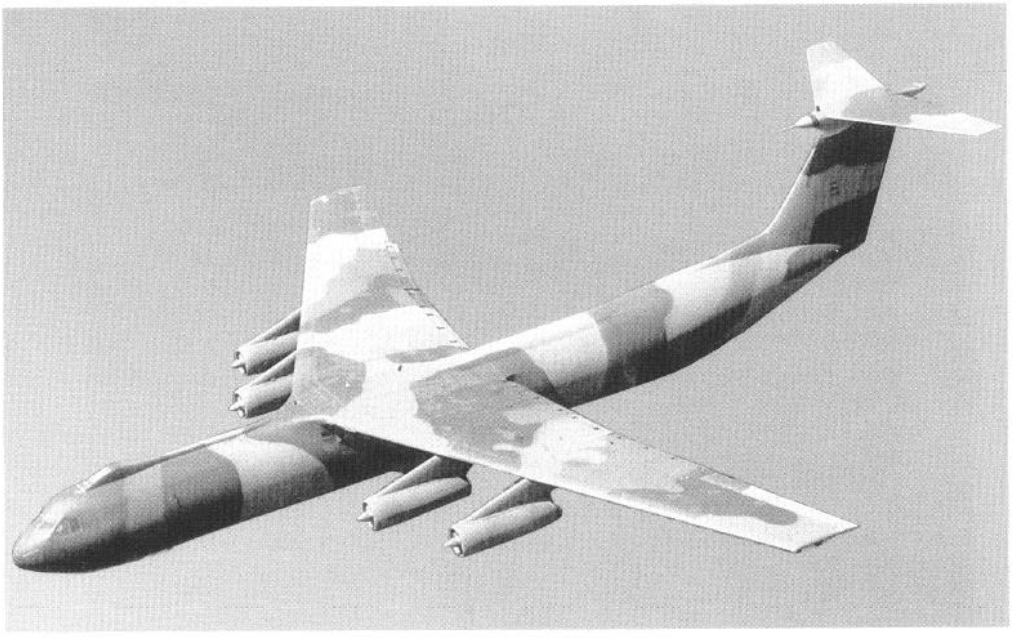
President George Bush, center, with Secretary of Defense Richard B. "Dick" Cheney on his right and the Chairman of the Joint Chiefs of Staff General Colin L. Powell, USA, on his left, in the JCS Conference Room ("the Tank") at the Pentagon in January 1991 shortly after the war started.



C-5 Galaxy



C-141 Starlifter

Fast Sealift Ship **Algol**

Maritime Prepositioning Ship **1ST LT Baldomero Lopez**

CHRONOLOGY

2 Aug 90: Iraq invaded Kuwait.

4 Aug 90: Air Force General Hansford T. Johnson, Commander in Chief, United States Transportation Command, activated his Crisis Action Team effective 040630Z.

7 Aug 90: C-Day--beginning of deployment. Desert Shield began.

The first Military Airlift Command flight arrived in the area of operations.

Maritime Prepositioning Squadrons 2 and 3 were alerted for possible deployment for the first ever wartime test of the Afloat Prepositioning Force.

Military Sealift Command activated three of the Fast Sealift Ships.

8 Aug 90: The first volunteer commercial aircraft flew in support of Desert Shield.

Military Sealift Command activated the remaining five Fast Sealift Ships.

Military Traffic Management Command reported the first seaport of embarkation (Savannah, Georgia) operational.

Military Traffic Management Command, for the first time, initiated the Contingency Response Program.

10 Aug 90: At Military Sealift Command's request, the Maritime Administration activated all 17 of the Ready Reserve Force's Roll-On/Roll-Off vessels.

13 Aug 90: First ship, Fast Sealift Ship *Capella* embarked from Savannah, Georgia, in support of Desert Shield.

15 Aug 90: Maritime Prepositioning Squadron 2 Roll-On/Roll-Off vessels *Anderson*, *Bonnyman*, and *Hauge*, the first ships to arrive in Saudi Arabia in support of Desert Shield, began unloading 7th Marine Expeditionary Brigade equipment and supplies at Al Jubayl, Saudi Arabia.

Mid-Aug 90: 95 percent of operable C-5s and 90 percent of operable C-141s, along with aircraft volunteered by the airlines, were flying what became known as the "aluminum bridge."

17 Aug 90: Air Force General Hansford T. Johnson, Commander in Chief, United States Transportation Command (USTRANSCOM), activated Stage I of the Civil Reserve Air Fleet program, which guaranteed USTRANSCOM the use of an additional 17 Long Range International (LRI) passenger and 21 LRI cargo aircraft.

The Prepositioning Ships of the Afloat Prepositioning Force began arriving in Saudi Arabia from Diego Garcia.

21 Aug 90: Air Force General Hansford T. Johnson, Commander in Chief, United States Transportation Command, gave the Department of Defense's first Desert Shield press conference.

23 Aug 90: The Special Middle East Sealift Agreement (SMESA) contract was awarded. The contract called for a 10-week-long service, beginning on the 27th, with a government option for extensions. The first large-scale military use of commercial intermodal systems, SMESA proved both flexible and reliable.

25 Aug 90: The four ships of Maritime Prepositioning Squadron 3, supporting the 1st Marine Expeditionary Brigade, began arriving in Saudi Arabia.

27 Aug 90: The first Fast Sealift Ship, *Capella*, arrived in Saudi Arabia.

29 Aug 90: United States Transportation Command experienced its one and only Desert Shield/Desert Storm catastrophic accident when a C-5 crashed departing Ramstein Air Base (AB), Germany, for the Persian Gulf loaded with medical supplies, food, and aircraft maintenance equipment. Thirteen of the 17 personnel on board were killed.

9 Sep 90: The first Ready Reserve Force ships, *Cape Henry* and *Cape Inscription*, arrived in Saudi Arabia.

The first charter vessel, *American Eagle*, arrived in Saudi Arabia.

18 Sep 90: The first foreign charter ship, Canadian flag ASL *Cygnus*, arrived in Ad Damman.

23 Sep 90: The Fast Sealift Ship (FSS) *Altair* arrived in Saudi Arabia carrying *Antares*' cargo, closing the 24th Infantry Division three weeks later than planned.

Military Traffic Management Command completed a test run of trucking containers over land from the Red Sea port of Jeddah across Saudi Arabia to Ad Damman.

16 Oct 90: Military Traffic Management Command deactivated the formal Contingency Response Program although the program continued throughout the operation to serve informally as the command's conduit to industry.

30 Oct 90: Desert Express began operation. Initiated by Military Airlift Command at United States Transportation Command's direction, Desert Express carried United States Central Command's war-stopper requirements cargo daily via a C-141 from Charleston Air Force Base (AFB), South Carolina, to Dhahran and Riyadh, Saudi Arabia.

8 Nov 90: The President announced deployment of additional US forces, including two heavy armored divisions from the Army's VII Corps in Germany.

10 Nov 90: The Logistics Support Agreement was signed by the United States and Saudi Arabian governments. Under the agreement, the Saudis agreed to provide free fuel to US Desert Shield forces operating in Saudi Arabia and its surrounding waters.

8 Dec 90: European Desert Express began operation between Rhein-Main AB, Germany, and the Persian Gulf.

9 Dec 90: The Joint Transportation Board met to discuss the airlift sustainment cargo backlog.

13 Dec 90: The four ships of Maritime Prepositioning Squadron 1, supporting elements of the II Marine Expeditionary Force, arrived in Saudi Arabia.

23 Dec 90: The airlift sustainment cargo backlog peaked in the United States at nearly 10,300 tons.

23 Dec 90 - 13 Jan 91: Four Sealift Express ships sailed. Sealift Express was an expansion of the Special Middle East Sealift Agreement to expedite delivery of air-eligible cargo that USTRANSCOM had diverted to sealift for lack of space on aircraft.

31 Dec 90: 217 ships--132 en route, 57 returning, and 28 loading or unloading--formed a virtual "steel bridge" across the Atlantic Ocean. This equated to approximately one ship every 50 miles from Savannah, Georgia, to the Persian Gulf.

Late Dec 90: Four C-9 Naval Air Reserve squadrons deployed from their home stations to Europe. This was the first time Navy C-9 aircraft served in the common-user role.

Dec 90-Jan 91: Reflecting wartime tempo deployment, up to 127 planes landed daily in Southwest Asia, averaging one arrival every 11 minutes.

15 Jan 91: Force closure deadline.

17 Jan 91: D-Day (16 January, 1900 EST). Desert Storm commenced.

Just prior to hostilities and to help ensure a steady stream of resupply, Secretary of Defense Richard B. "Dick" Cheney, acting on Air Force General Hansford T. Johnson's request of the previous day, activated Stage II of the Civil Reserve Air Fleet.

18 Jan 91: Iraq fired SCUD missiles into Israel prompting President Bush to assure Israel's Prime Minister Yitzhak Shamir that the United States would help defend Israel against further attacks.

19 Jan 91: The Chairman, Joint Chiefs of Staff, ordered United States Commander in Chief, Europe, as the supported commander, and Commander in Chief, United States Transportation Command, as the supporting commander, to deploy two Patriot fire units--personnel, launchers, missiles, and command, control, and communications gear--to Israel within 24 hours.

22 Jan 91: The Iraqis launched their second SCUD attack on Israel and the newly-arrived Patriots intercepted and destroyed the missile.

13 Feb 91: A second Desert Express mission per day began to help move a backlog of 9AU cargo.

The nation's major rail companies and unions, representing nearly a quarter of a million workers, agreed to a 60-day extension of contract talks from a 15 February contract deadline.

24 Feb 91: Ground war commenced.

28 Feb 91: Cessation of hostilities.

10 Mar 91: R-Day--beginning of redeployment.

14 Mar 91: Desert Express discontinued.

Vice Admiral Paul D. Butcher, USN
Deputy Commander in Chief
United States Transportation Command
February 1990-March 1991

Admiral William J. Crowe, Jr., USN
Chairman of the Joint Chiefs of Staff
October 1985-September 1989

CHAPTER I

INTRODUCTION

NIFTY NUGGET AND THE JOINT DEPLOYMENT AGENCY

In the fall of 1978, command post exercise Nifty Nugget simulated a fast breaking attack by the Warsaw Pact on North Atlantic Treaty Organization (NATO) forces in Europe. The first government-wide mobilization effort since World War II, the exercise tested the mobilization plans, systems, and procedures of military and civilian federal agencies. Overall exercise objectives also included: development of options during a period of rising tension, determining manpower shortfalls and logistics limitations, and identifying critical resource shortages during a protracted conventional war. In particular, Nifty Nugget evaluated cooperation between the Department of Defense (DOD) and other federal agencies during mobilization and deployment of US forces.[1]

Nifty Nugget exposed great gaps in understanding between military and civilian participants who could not even agree on the meaning of the word "mobilization," and as a result, mobilization and deployment plans fell apart. The scenario, for instance, demanded between 200,000 and 500,000 more soldiers than DOD could locate. Confusion made it nearly impossible to transport the reinforcements who were ready to deploy. In one case, airlifters received 27 validated requests to move the same unit to 27 different places. Most of the 400,000 American troops in theater "died" in the first few weeks of the exercise because the United States could not resupply them with artillery shells, tank rounds, and other ammunition. The exercise also identified a shortage of allied doctors and medical facilities overseas, which meant that the United States had to airlift its wounded back home for treatment, further taxing transportation resources.[2]

Two major recommendations came out of Nifty Nugget. First, the Transportation Operating Agencies (later called Transportation Component Commands) should have a direct reporting chain to the Joint Chiefs of Staff (JCS). Second, the JCS should establish a single manager for deployment and execution. As a result, the JCS formed the Joint Deployment Agency (JDA) at MacDill Air Force Base (AFB), Florida, in 1979. Over the next eight years, the JDA significantly improved US force projection capability for which the Chairman, Joint Chiefs of Staff (CJCS) Navy Admiral William J. Crowe, Jr., awarded it the Joint Meritorious Unit Award in December 1987.[3]

Despite its many successes, the JDA could not finish the job. Although the JDA had responsibility for integrating deployment procedures, it did not have authority to direct the Transportation Operating Agencies or Unified and

Specified Commanders in Chief (CINCs) to take corrective actions, keep data bases current, or adhere to milestones. According to several independent studies on transportation,* DOD needed to consolidate transportation. (See Appendix 1.) As a result of a recommendation made by the President's Blue Ribbon Commission on Defense Management (nicknamed the Packard Commission after its chairman David Packard) that "the Secretary of Defense should establish a single unified command to integrate global air, land, and sea transport,"[4] President Ronald Reagan signed National Security Decision Directive (NSDD) No. 219 on 1 April 1986. In NSDD No. 219, the President stated:

> I also support the recommendation of the [Packard] Commission that the current statutory prohibition on the establishment of a single unified command for transportation be repealed. Assuming this provision of law will be repealed, the Secretary of Defense will take those steps necessary to establish a single unified command to provide global air, land, and sea transportation.[5]

FORMATION OF UNITED STATES TRANSPORTATION COMMAND

Anticipating the President's guidance, Admiral Crowe had organized a general officer and flag officer steering committee the previous month, in March 1986, to begin planning for the Unified Transportation Command.[6] The Steering Committee in turn appointed an O-6 (colonels and Navy captains) working group to draft a Unified Transportation Command (UTC) Implementation Plan.[7] On 12 March 1987, Air Force General Robert T. Herres, Acting Chairman, JCS, signed the document,[8]** and on 10 April, Secretary of Defense Caspar W. Weinberger approved it.[9] Consequently, on 18 April, President Reagan ordered the establishment of the Unified Transportation Command,[10] a directive made possible in part by the Goldwater-Nichols Department of Defense Reorganization Act of 1986, which ordered the Secretary of Defense to consider creation of a unified transportation command and revoked the law preventing it with the words:

> prohibition against consolidating functions of military transportation commands--Section 1110 of the Department of Defense Authorization Act, 1983 (Public Law 77-252, 96 Stat. 747) is repealed."[11]

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*Harbridge House, 1980; Dalton Study, 1981; Wharton Applied Research Center, 1983; Grace Commission, 1983; General Accounting Office Review of the Joint Deployment System, 1986; and the President's Blue Ribbon Commission on Defense Management (Packard Commission), 1986.

**General Herres coordinated on the document and forwarded it to the Secretary of Defense for approval over the nonconcurrence of the Chief of Naval Operations and Commandant of the Marine Corps, which would have been unlikely and probably impossible without the Chairman's increased clout under Goldwater-Nichols.

Under its Implementation Plan, the UTC's mission was to "provide global air, sea, and land transportation to meet national security needs." The command, newly christened United States Transportation Command (USTRANSCOM), had three component commands, the Air Force's Military Airlift Command (MAC), the Navy's Military Sealift Command (MSC), and the Army's Military Traffic Management Command (MTMC). The JDA's missions and functions transferred to USTRANSCOM on 18 April, when the agency became the command's Directorate of Deployment. Additionally, the Implementation Plan located the command at Scott AFB, Illinois, to take advantage of MAC's expertise in command and control. A DOD prototype second to none, the Headquarters MAC Command Center would be the centerpiece of USTRANSCOM's command and control. Military Airlift Command also offered the advantages of a highly developed and refined global communications net, extensive knowledge and experience in automatic data processing, and manpower for "dual-hatting" to USTRANSCOM. On 22 June, the President nominated Air Force General Duane H. Cassidy as the first Commander in Chief, USTRANSCOM (USCINCTRANS)[12] and on 1 July the Senate confirmed the recommendation, thus activating the command at Scott.[13] USCINCTRANS received operational direction from the National Command Authorities (NCAs) through the Chairman, Joint Chiefs of Staff.[14] The command's chain of command has remained the same throughout its history. (See Table I-1.)

USTRANSCOM appeared, at first glance, to be the long sought after remedy for DOD's fragmented and often criticized transportation system. Its establishment gave the United States, for the first time, a four-star, unified command CINC to serve as single-point-of-contact for Defense Transportation System (DTS) customers and to act as advocate for DTS in DOD and before Congress. But it soon became apparent that, in reality, the nation's newest unified command was created half-baked. USTRANSCOM's Implementation Plan, the command's original "charter," allowed the services--Air Force, Army, and Navy--to retain their single-manager charters for their respective transportation modes--air, land, and sea. Even more restrictive, the document limited USCINCTRANS' authorities primarily to wartime. The Implementation Plan's main body asserted USTRANSCOM to be a "wartime-oriented" command, while Appendix A, "Command, Organization, and Relationships," specified that the command would coordinate with the services on "wartime-related" transportation and traffic management issues. Interestingly, neither the implementing letter signed by General Herres nor the Executive Summary suggested that USCINCTRANS' authorities were to be limited to wartime.[15]

How was Congress and the President's intent to form a wartime and peacetime, fully-operational unified transportation command thwarted? Vice Admiral Paul D. Butcher, then a rear admiral (upper half) and on the Chief of Naval Operations staff, and later USTRANSCOM's Deputy Commander in Chief during

Desert Shield/Desert Storm, played a crucial role by adding the wartime phrasing to the Implementation Plan during the document's final coordination at the Joint Chiefs of Staff level.[16]*

USTRANSCOM's authorities on the eve of Desert Shield/Desert Storm were as outlined in Table I-2. During peacetime, USTRANSCOM's Transportation Component Commands continued to operate day-to-day much as they did in the past. They controlled their industrial funds and maintained responsibility for service-unique missions, service-oriented procurement and maintenance scheduling, and DOD charters during peacetime single-manager transportation operations. They also continued to have operational control of forces.[17] It would take a wartime test by fire, Desert Shield/Desert Storm, to bring to maturity a fully operational, peacetime and wartime, USTRANSCOM.

---

*In December 1989, the command's Deputy Commander in Chief, Vice Admiral Albert J. Herberger, and Chief of Staff, Air Force Colonel David S. "Davy" Hinton, asked Dr. James K. Matthews, the Command Historian, to research why the command's Implementation Plan (IP) limited USTRANSCOM's mission to wartime. The historian discovered that drafts of the IP did not contain the word "wartime." Digging deeper, he called retired Army Colonel George F. "Buckey" Pool, who was the Joint Deployment Agency representative on the Unified Transportation Command Implementation Plan O-6 Working Group, and asked him when the word "wartime" first appeared in the IP and who was responsible for putting it there. Colonel Pool's answer: the change had been made at the "midnight hour," during the final coordination at the Joint Chiefs of Staff level, and the culprit had been a "rear admiral on the CNO's [Chief of Naval Operation's] staff named Butcher." (SOURCE: MFR (U), James K. Matthews to Cols Smallheer and Pearce, [USTRANSCOM charter], 12 Jan 90.)

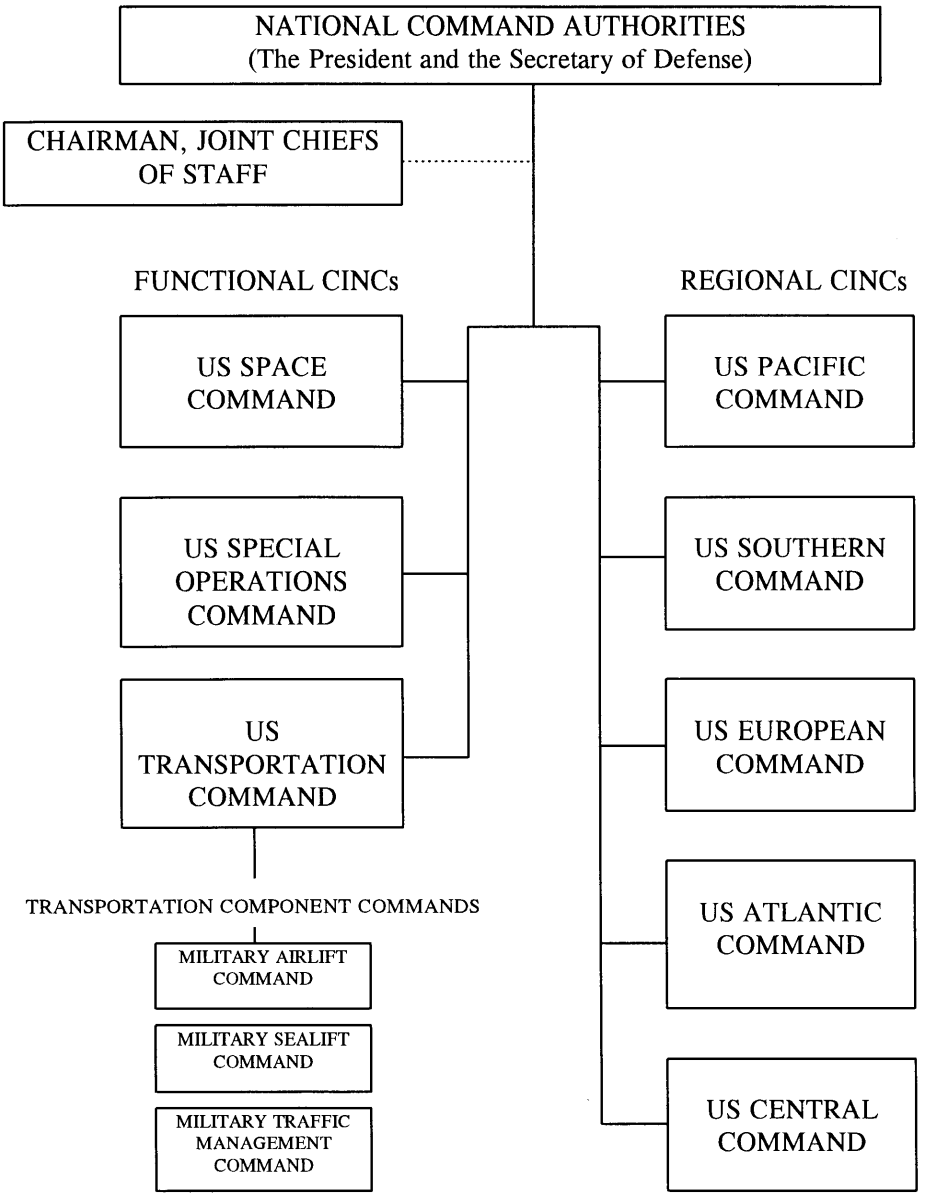
Nobody--not Admiral Herberger, Colonel Hinton, or Dr. Matthews--appreciated the irony of this anecdote more than Admiral Butcher. As he related in an interview with the Command Historian following the Gulf War, his number one priority at USTRANSCOM, as ordered by Air Force General Hansford T. Johnson, USCINCTRANS, was to work with the services, Joint Staff, and Office of the Secretary of Defense to remove the word "wartime" from the command's charter. He also stated that, as Commander MSC, his assignment following the one with the CNO, he had already "begun to see the light," but it was his Desert Shield/Desert Storm experiences as USTRANSCOM Deputy CINC (DCINC), especially seeing the pain DTS customers endured during the transition from peace to war in August 1990, that converted him and made him a proselytizer for a new USTRANSCOM peacetime, single-manager charter.

Asked if he regretted having added the wartime phrases to the original document, he replied that, at the time, he believed he was acting in the best interests of the Navy, as laid out for him by the CNO and the Secretary of the Navy. He added that, with hindsight, it was "one of the dumbest things" he had ever done in his career. Admiral Butcher had come to believe that it was in the nation's best interest for USTRANSCOM and its component commands to operate in peacetime as they would during crises, contingencies, and war. Unfortunately, he did not live to see the new USTRANSCOM. He died from a heart attack on 2 August 1992, thirteen months after he retired from the Navy with almost 43 years service. (SOURCE: Intvw (U), Dr. James K. Matthews, with VADM Paul D. Butcher, 9 Mar 91; Official biography on file in USTRANSCOM Research Center; Article (U), "Admiral Butcher Reflects on 43-year Career," *Command Post*, p. 7, 18 Jan 91.)

Secretary of Defense Caspar W. Weinberger
January 1981-November 1987

TABLE I-1

USTRANSCOM IN THE UNIFIED COMMAND STRUCTURE



SOURCE: Joint Officers Handbook, AFSC Publication 1, 1990.

TABLE I-2

FUNCTIONS OF USTRANSCOM UNDER ITS 1987 IMPLEMENTATION PLAN

JOINT DEPLOYMENT SYSTEM (JDS)

Refine, administer, and operate the JDS.
Train JDS users in the operation of the system.

DELIBERATE PLANNING

Develop and refine joint procedures and directives.
Maintain the Time Phased Force Deployment Database (TPFDD).
Sponsor the JDS users group.

EXECUTION PLANNING

Provide deployment data to National Command Authorities, Joint Chiefs of Staff, and CINCs.
Evaluate courses of action.
Aid in transportation allocation decisions.
With the supported CINC, refine the TPFDD.

COMMAND, CONTROL, COMMUNICATIONS, and COMPUTER SYSTEMS

Integrate transportation mobility and deployment automatic data processing (ADP) systems into a single deployment system.
Operate and maintain the system.
Integrate it with DOD command and control systems.
Coordinate acquisition of transportation-related ADP systems with the services, CINCs, and Transportation Operating Agencies to ensure overall system compatibility.

SOURCE: USTRANSCOM Implementation Plan, 12 March 1987.

CHAPTER I NOTES

1. Hist (U), USTRANSCOM Annual History, Dr. James K. Matthews and Cora J. Holt, 1987.

2. The USTRANSCOM Research Center holds an extensive collection of documents on Nifty Nugget. See especially Rpt, OJCS/J-3, Summary Analyses Exercise Nifty Nugget 78, 11 Apr 79.

3. Upon its inactivation in April 1987, the JDA retired its historical reports and archives, 1979-1987, to USTRANSCOM. See Joint Deployment Agency in the USTRANSCOM Archives; Memo (S/NOFORN-DECL OADR), JDA to JCS, Recommendation for Award of the Joint Meritorious Unit Award (JMUA) (U), 28 Oct 87 with 3 atchs: (1) Narrative (S-DECL OADR), (2) Citation (U), (3) List of Terms and Acronyms (U); SO J-1PM-1792-87 (U), JCS, Announcement of the Joint Meritorious Unit Award, 9 Dec 87; Memo (U), JCS to USCINCSOC, Award of the Joint Meritorious Unit Award, 18 Aug 88.

4. Telefax (U), SAF/LLIC to USTRANSCOM/TCHO, President's Blue Ribbon Commission on Defense Management Commissioners' Addresses and Telephone Numbers, 4 May 87; Rpt (U), Packard Commission to President, An Interim Report to the President by the President's Blue Ribbon Commission on Defense Management, 28 Feb 86; Ltr (U), Packard Commission to President, President's Blue Ribbon Commission on Defense Management, 30 Jun 86 with atch: Rpt (U), Packard Commission, President's Blue Ribbon Commission on Defense Management, Final Report to President, 30 Jun 86; Statement (U), David Packard to Press Conference, [President's Blue Ribbon Commission on Defense Management Final Report], 2 Jul 86.

5. Memo (U), John M. Poindexter to Vice President et al., Implementation of the Recommendation of the President's Commission on Defense Management (U), 1 Apr 86, with atch: NSDD No. 219 (S-DECL OADR), Ronald Reagan, President of the United States, Implementation of Recommendation of President's Commission on Defense Management (U), 1 Apr 86.

6. Memo (U), CJCS to JCS and USREDCOM/CC, Establishment of a Unified Transportation Command, 20 Mar 86.

7. Unified Transportation Command Implementation Plan Working Group files in USTRANSCOM Office of History.

8. Memo (U), CJCS to SECDEF, Implementation Plan to Establish the US Transportation Command, 12 Mar 87, with atch: Plan (U), Implementation Plan for the Establishment of the United States Transportation Command, (hereafter cited as Plan (U), USTRANSCOM Implementation Plan); Memo (U), TCCS to USCINCTRANS, Supported CINC vs Primary CINC, 9 Jun 87, without atchs.

9. Memo (U), SECDEF to CJCS, Implementation Plan to Establish the US Transportation Command, 10 Apr 87.

10. Memo (U), President Reagan to SECDEF, Establishment of the Unified Transportation Command, 18 Apr 87; Memo (U), SECDEF to JCS, Unified Command Plan (UCP), 5 May 87; Memo (U), TCCS to USCINCTRANS, Memorandum for Information, 26 May 87 w/atch: Msg (U), President Reagan to Congress of the United States, Notification of Changes to the Unified and Specified Combatant Structure, Pursuant to 10 U.S.C. 161(b), 23 Apr 87; Article (U), *News-Democrat*, "Command Will Keep Low Profile," Belleville IL, 24 Jun 87; Article (U),*Command Post*, "CINCMAC Heads New Command," Belleville IL, 26 Jun 87; MFR (U), TCHO, [USTRANSCOM Birthday], 14 Oct 87. A disagreement between the Senate and the Secretary of Defense over the nomination of a new Assistant Secretary of Defense for Special Operations and Low Intensity Conflict delayed confirmation of General Cassidy as USCINCTRANS. Until the issue could be resolved, the Vice Chairman of the JCS named CINCMAC as Executive Agent for USTRANSCOM. Msg (U), VCJCS to CSAF, Establishment of US Transportation Command, 271815Z Apr 87; Ltr (U), US Senate to SECDEF, [Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict], 19 May 87.

11. Mailnote (U), TCPA, CINCUSTRANSCOM, n.d.

12. Public Law 99-433 (U), 99th Congress, Goldwater-Nichols Department of Defense Reorganization Act of 1986, 1 Oct 86; Point Paper (U), MAC/XPPD, Goldwater-Nichols DOD Reorganization Act of 1986, Section 162 (9a) (4), 14 Nov 86.

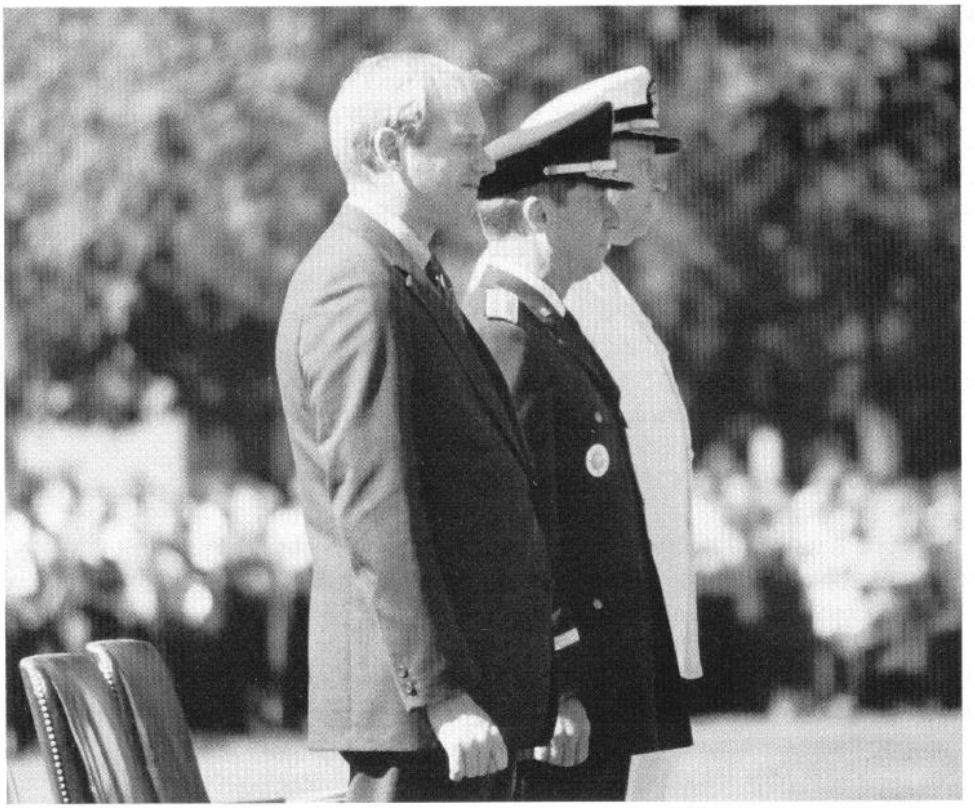
13. Summary Sheet (U), OJCS to VCJCS, Senate Confirmation of General Cassidy, 9 Jul 87 w/atch: Msg (U), USCINCTRANS/TCCS to JCS/J7/et al., Establishment of US Transportation Command, 012100Z May 87; Msg (U), SECDEF to JCS, et al., Activation of FORSCOM and USTRANSCOM, 101603Z Aug 87.

14. Plan (U), USTRANSCOM Implementation Plan; Article (U), *Defense 87 Magazine*, "Transportation Command: One-Stop Mobility Shopping," Dr. James K. Matthews and Mark A. Williams for General Duane H. Cassidy, Commander in Chief, United States Transportation Command.

15. Plan (U), USTRANSCOM Implementation Plan.

16. USTRANSCOM Formation Archives, USTRANSCOM Office of History; MFR (U), Dr. James L. Matthews, to Cols Smallheer and Pearce, 12 Jan 90; Intvw (U), Dr. James K. Matthews, Command Historian, USTRANSCOM, with VADM Paul D. Butcher, 9 Mar 91.

17. Plan (U), USTRANSCOM Implementation Plan.



Reviewing the Troops -- USTRANSCOM's Activation Ceremony, 1 October 1987, Scott AFB, Illinois. Left to right: William H. Taft, IV, Deputy Secretary of Defense; General Duane H. Cassidy, USAF, Commander in Chief, USTRANSCOM; and Admiral William J. Crowe, Jr., Chairman of the Joint Chiefs of Staff.

CHAPTER II

STRATEGIC DEPLOYMENT MANAGEMENT

CHAIN OF COMMAND

Desert Shield/Desert Storm marked the end of an era. In the post-Cold War world, the perceived threat had changed and so had US strategy. Shifting focus from a superpower conflict in Europe to regional contingencies worldwide prompted a reduction of overall US forces and; more importantly, resulted in fewer forces forward deployed. These circumstances put increased emphasis on strategic lift. The first major military confrontation in the post-Cold War era, Desert Shield/Desert Storm showed that America must be prepared to deploy its forces great distances with little warning.

By strengthening joint command relations and increasing the role of the Chairman, Joint Chiefs of Staff (CJCS) and unified commanders, the Goldwater-Nichols Department of Defense (DOD) Reorganization Act of 1986 established the chain of command that made possible such a deployment. The act clarified the military chain of command: an entire theater of operations--in this case the geographical area DOD called Southwest Asia, which included the Persian Gulf region, the Indian Ocean, and parts of East Africa--came under the complete control of a single commander in chief (CINC). During Desert Shield/Desert Storm, that was Army General H. Norman Schwarzkopf, Commander in Chief, US Central Command (USCINCCENT). His chain of command ran through the Chairman, Joint Chiefs of Staff, and Secretary of Defense to the President of the United States, who as head of state and government was also Commander in Chief of the Armed Forces. As the "supported" CINC, General Schwarzkopf established requirements and set priorities for the other unified and specified command CINCs, who were called "supporting" CINCs. As discussed in Chapter I, the Goldwater-Nichols Act also helped set the scene for establishing a new unified command, United States Transportation Command (USTRANSCOM), to integrate the transportation modes for DOD. Desert Shield/Desert Storm represented the first time in US history that the nation had a single command to coordinate strategic deployment during a major military operation. Supporting Commander in Chief, USTRANSCOM (USCINCTRANS), Air Force General Hansford T. Johnson, directed his Transportation Component Commands (TCCs) --Military Airlift Command (MAC), Military Sealift Command (MSC), and Military Traffic Management Command (MTMC)--to provide strategic lift and to execute the Desert Shield/Desert Storm deployment so that troops and materiel arrived in the United States Central Command's (USCENTCOM's) area of responsibility (AOR) as required by the supported CINC.

STRATEGIC LIFT ACCOMPLISHMENTS

The deployment for Desert Shield/Desert Storm* ranks among the largest in history. From 7 August 1990 (C-Day, commencement) to 10 March 1991 (R-Day, beginning of redeployment) USTRANSCOM, in concert with its TCCs, moved to USCENTCOM's area of responsibility nearly 504,000 passengers, 3.6 million tons of dry cargo, and 6.1 million tons of petroleum products, as seen in Table II-1.[1] This equated roughly to the deployment and sustainment of two Army corps, two Marine Corps expeditionary forces, and 28 Air Force tactical fighter squadrons. (See Appendix 2 and Table II-2.)[2**] To paraphrase Winston Churchill, no nation ever moved so many and so much, so far, so fast. The status of forces for USTRANSCOM and the TCCs as of August 1990 are outlined in Table II-3.[3]

The deployment's complexity and immensity invites historical comparison. During the first three weeks of Desert Shield, USTRANSCOM moved more passengers and equipment to the Persian Gulf than the United States transported to Korea during the first three months of the Korean War. By the sixth week the total ton miles flown*** surpassed that of the 65-week-long Berlin Airlift. Desert Shield/Desert Storm sealift was equally historic. For instance, the number of cargo ships arriving in the Persian Gulf in the first five months of Desert Shield matched that of the 18-month-long allied convoy operations to Northern Russia during World War II. In contemporary terms, the command moved to the Persian Gulf area, via air and sea, the rough equivalent of Atlanta, Georgia--all its people and their clothing, food, cars, and other belongings--half way around the world in just under seven months.[4] General Schwarzkopf called the task "daunting" and the result "spectacular." Secretary of Defense Richard B. "Dick" Cheney termed the deployment "a logistical marvel," while the Chairman, Joint Chiefs of Staff, Army General Colin L. Powell, told Congress it had proven USTRANSCOM's worth. He called Desert Shield/Desert Storm the command's "graduation exercise," and as far as he, Secretary Cheney, and President George Bush were concerned, USTRANSCOM had "graduated magna

*The operation had no official name until 9 August 1990 when the Joint Chiefs of Staff (JCS) dubbed it "Desert Shield." On 17 January 1991 (16 January, 1900 EST), at the outset of combat operations against Iraq, the JCS changed the title to "Desert Storm."

**Desert Shield/Desert Storm documents are rarely in agreement on dates units closed in the USCENTCOM area of responsibility. A lack of consensus on what constituted unit "arrival," "closure," "deployment completion," and "combat readiness" at USCENTCOM and throughout the Department of Defense caused much of the confusion. The authors' principal goal here is to describe the general flow of air, land, and sea forces to the area of operations rather than set with precision the exact moment a unit "closed."

***"Ton-mile" equals one ton moved one mile. It is a gross measurement of airlift capability based on aircraft numbers, average payload, daily flying hours, average speeds, and one-way productivity. The average ton miles flown daily for Desert Shield/Desert Storm and the Berlin Airlift were 13.6 million and 1.2 million, respectively. See 1990 MAC History, p. 267.

TABLE II-1

DESERT SHIELD/DESERT STORM STRATEGIC LIFT SUMMARY
PASSENGERS AND CARGO
(As of 10 March 1991)

AIRLIFT

	UNIT CARGO	SUSTAINMENT	DESERT EXPRESS[1]	EUROPEAN EXPRESS[1]	PAX
Aug 90	46,946[4]	--	--	--	67,263[4]
Sep 90	49,738	19,142	--	--	60,476
Oct 90	33,781	20,512	2	--	51,154
Nov 90	9,663	34,028	235	--	20,553
Dec 90	52,045	38,064	399	375	105,413
Jan 91	80,903	36,372	580	488	132,095
Feb 91	52,009	42,611	637	442	45,562
Mar 91 (1-10)	9,831	14,396	213	136	18,204
TOTAL	334,916	205,125	2,066	1,441	500,720

TOTAL AIR CARGO (short tons):	543,548	(15.13%)
% OF ALL CARGO INCLUDING POL[3]:		(5.61%)
TOTAL AIR PAX:	500,720	(99.45%)

SEALIFT

	UNIT CARGO[2]	SUSTAINMENT	POL[3]	PAX
Aug 90	253,014	--	333,640	315
Sep 90	252,013	--	508,534	681
Oct 90	326,930	74,614	517,038	436
Nov 9	206,416	54,119	1,011,243	186
Dec 9	356,025	97,499	894,061	465
Jan 91	712,373	166,466	1,088,825	516
Feb 91	297,888	165,363	1,336,807	147
Mar 91 (1-10)	27,210	58,602	412,858	12
TOTAL	2,431,869	616,663	6,103,006	2,758

TOTAL SEA DRY CARGO (short tons):	3,048,532	(84.87%)
% OF ALL CARGO INCLUDING POL[3]:	9,151,547	(94.39%)
TOTAL SEA PAX:	2,758	(.55%)
AIR & SEA TOTAL DRY CARGO (short tons):	3,592,089	
TOTAL AIR & SEA INCLUDING POL[3]:	9,695,095	
AIR & SEA TOTAL PAX:	503,478	

1. Includes both war-stopper requirements (coded "9AU") and Desert Shield/Desert Storm airlift cargo (coded "9BU") cargo.

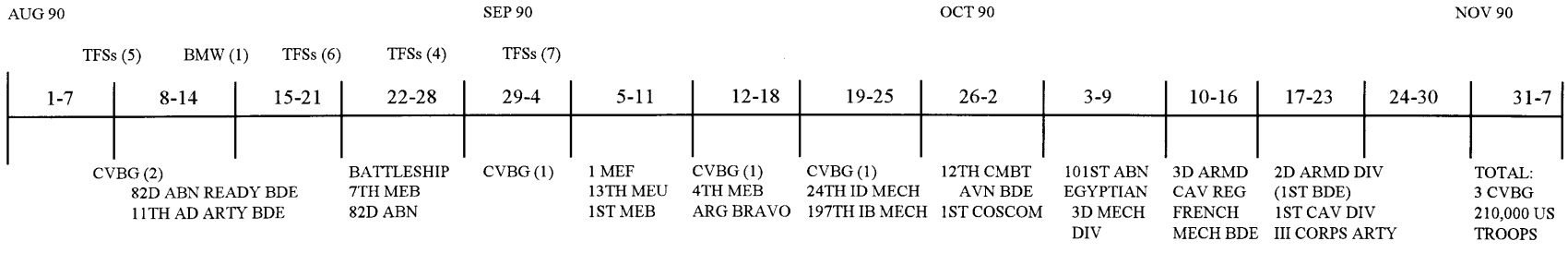
2. Includes ammunition. 3. Petroleum, oil, and lubricants. 4. As of 4 September 1990.

SOURCE: Military Sealift Command (MSC) Lift Summary Reports and USTRANSCOM Situation Reports (SITREPs).

TABLE II-2
FORCE PROJECTION: ARRIVALS IN AOR
PHASE I (7 AUG-7 NOV 90) - PHASE II (8 NOV 90-28 FEB 91)

2 Aug: Iraq Invaded Kuwait
7 Aug: Desert Shield Began

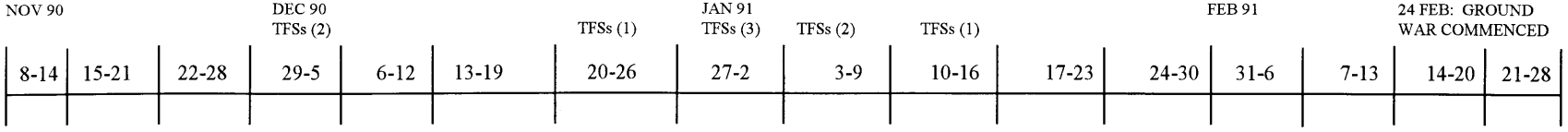
PHASE I AIR DEPLOYMENT COMPLETE: 962 FIXED WING AIRCRAFT (600 COMBAT)



17 JAN--D-DAY (16 JAN, 7PM EST)
DESERT STORM COMMENCED

TOTAL US AIRCRAFT: 1,963
--1,299 COMBAT AND COMBAT SUPPORT
--258 TANKERS
--144 AIRLIFT
--45 COMMAND AND CONTROL
--114 RECONNAISSANCE UNITS
--103 OTHER SUPPORT

TOTAL US SHIPS: 108 (6 CVBG)
--34 PERSIAN GULF (2 CVBG)
--35 NORTH ARABIAN SEA (1 CVBG))
--26 RED SEA (3 CVBG)
--13 MEDITERRANEAN



TOTAL US GROUND FORCES:
300,000 ARMY TROOPS
84,000 MARINES

ABN - Airborne
AD ARTY BDE - Air Defense Artillery Brigade
ARG - Amphibious Ready Group
ARMD CAV REG - Armored Cavalry Regiment
ARMD DIV - Armored Division
BMW - Bombardment Wing
CAV DIV - Cavalry Division
CMBT AVN BDE - Combat Aviation Brigade
COSCOM - Corps Support Command
CVBG - Carrier Battle Group
FOR SVC SUPT GRP - Force Service Support Group
IB - Infantry Brigade
ID - Infantry Division
MAW - Marine Aircraft Wing
MEB - Marine Expeditionary Brigade
MEU - Marine Expeditionary Unit
MEF - Marine Expeditionary Force
TFS - Tactical Fighter Squadron

TABLE II-3

STATUS OF FORCES

UNITED STATES TRANSPORTATION COMMAND

(As of August 1990)

COMMANDER:	General Hansford T. Johnson, USAF
HEADQUARTERS:	Scott AFB, Illinois
PERSONNEL:	406 Active duty military and civilians 36 Reserve Recall/Mobilization (50% manned)
MISSION:	To provide global air, sea, and land transportation to meet national security needs

MILITARY AIRLIFT COMMAND

(As of August 1990)

COMMANDER:	General Hansford T. Johnson, USAF
HEADQUARTERS:	Scott AFB, Illinois
PERSONNEL:	89,048 Active duty military and civilians (70,547 Active duty military) (18,501 Civilian) 2,742 Headquarters 86,306 Field 65,760 Reserve Recall/Mobilization
MISSION:	- Strategic and tactical airlift - Aeromedical evacuation - Presidential airlift - Aerial search, rescue, and recovery of downed flyers - Audiovisual documentation

Strategic airlift forces under US Transportation Command: 234 C-141B
110 C-5A/B

TABLE II-3

STATUS OF FORCES (Con't)

MILITARY SEALIFT COMMAND
(As of August 1990)

COMMANDER: Vice Admiral Francis R. Donovan, USN

HEADQUARTERS: Washington, D.C.

PERSONNEL: 6,784 Active duty military and civilians
479 Headquarters
6,305 Field
2,337 Reserve Recall/Mobilization

MISSION:
- Provide sealift necessary to deploy military forces
- Sustain operational forces
- Provide fleet support
- Special mission support

FORCES UNDER US TRANSPORTATION COMMAND:

MSC Force:	40 Dry Cargo	Ready Reserve Force:	83 Dry Cargo
	23 Tanker		11 Tanker
	63 Total		2 Passenger
			96 Total

MILITARY TRAFFIC MANAGEMENT COMMAND
(As of August 1990)

COMMANDER: Major General John R. Piatak, USA

HEADQUARTERS: Falls Church, Virginia

PERSONNEL: 3,675 Active duty military and civilians
302 Headquarters
3,373 Field
4,149 Reserve Recall/Mobilization

MISSION:
- Provide responsive traffic management support to the nation's armed forces
- Operate common-user ocean terminals
- Administer programs for national defense and serve as the Department of Defense land-transportability agent.

FORCES UNDER US TRANSPORTATION COMMAND:

Defense Freight Railway Interchange Fleet:	1,421	Flat Cars
	32	Box Cars
	1,173	Tank Cars
	22	Other Train Cars
	2,648	Total Cars

cum laude."[5] USTRANSCOM's success was based on a synergism of military and commercial land lift, port operations, afloat prepositioning,* airlift, and sealift, as illustrated in Table II-4. Trucks, trains, and buses moved troops, equipment, and materiel to airports and seaports for loading and deployment to the Persian Gulf. Airlift carried the first deterrent, show-of-force Army, Marine Corps, and Air Force combat units. Supplemented by afloat prepositioning forces, airlift also carried their supplies and equipment. Throughout Desert Shield/Desert Storm, airlift delivered high priority, war-stopper cargo. As planned, airlift carried nearly all (99 percent) of the troops to the AOR,** as shown in Table II-1.[7] Airlift's speed and flexibility allowed USTRANSCOM to deploy troops to the Persian Gulf as their equipment arrived in the region by sea. Such close coordination expedited the movement of forces forward thus improving readiness and decreasing the burden on Saudi port areas to store cargo and support large numbers of troops. Limiting the time troops were concentrated in the cities and at the airports and seaports decreased their vulnerability to enemy attack by ballistic missiles and aircraft.[8] Moving troops forward expeditiously also pleased the host nation's Moslem leadership, who feared that contact with Westerners might undermine the indigenous culture. (The "marrying up" of troops and equipment did not always work in practice. See "Desert Storm Force Closures," Chapter IV.)

Sealift carried most of the supplies and equipment too large to fit on aircraft, although not as much as originally anticipated. During Desert Shield/Desert Storm, ships carried 85 percent of the dry cargo compared to the planning factor of 95 percent developed from the US' experiences in the Vietnam War and in Europe during World War II. The differences between Desert Shield/Desert Storm and the other two wars help explain this discrepancy. The great distance to the Persian Gulf, rapidly changing requirements and priorities, lack of intheater storage and reception facilities, the relatively small amount of prepositioned materiel in the region, the relatively short period of time to deploy, and shortages of critical items--such as atropine, uniforms, boots, and chemical weapons gear--resulted in a heavier than planned reliance on airlift. Combining petroleum, oil, and lubricants (POL) with total dry cargo sealifted, and comparing it to total cargo airlifted, gives a 94.4 to 5.6 ratio. As expected, nearly all POL (99 percent) traveled by sea (see Table II-1).[9] The transport of

*Saudi Arabia and its neighbors preferred American prepositioned equipment and materiel offshore and out of sight. Nevertheless, the Army and Air Force had stockpiled supplies--shelters, tents, generators, water purification equipment, vehicles, and munitions--ashore at Thumrait and Masirah in Oman. Prepositioned stocks, ashore and afloat, were significantly less than required.

**In December USTRANSCOM investigated the possibility of moving troops from Europe to the AOR via sea on Ready Reserve Force troopships but rejected the idea due to bad weather and time and money it would take to make a troopship sea worthy. For the same reasons, Secretary of Defense Cheney declined an offer by the owners of the SS *United States* to reactivate the superliner.[6] The few troops who deployed by sea, called supercargoes, did so to guard and maintain their equipment.

fuel for reconnaissance aircraft via C-141s accounted for the remainder. Perhaps most importantly, USTRANSCOM was heavily dependent on the civil sector. The command estimated that commercial industry provided, as expected, 85 percent of the transport during Desert Shield/Desert Storm.[10] Finally, based on USTRANSCOM's Desert Shield/Desert Storm experience, Department of Defense planners should count on transporting by air and sea approximately 20 tons of cargo, dry and POL, for each troop deployed.

TABLE II-4

PILLARS OF STRATEGIC MOBILITY

SOURCE: USTRANSCOM Command Briefing, 1994.

FORTUITOUS CIRCUMSTANCES

At first glance, the deployment to the Persian Gulf seemed a "worst case" scenario. USTRANSCOM had to move troops and equipment a tremendous distance. By air, it was 7,000 miles from the East Coast. Some troops had to travel from as far away as the West Coast, and that was 10,000 miles by air. The distance by sea through the Mediterranean and the Suez Canal was 9,000 miles from the East Coast and 11,000 from the West Coast. However, the situation could have been much worse. Fortunately, the Suez Canal was open, and traveling around Africa, a distance of 12,500 miles was not necessary. Air and sea lines of communication were unchallenged by enemy action. As it turned out, transporters did not have to deal with combat attrition. Furthermore, there was not a second, concurrent crisis.[11]

Other favorable circumstances facilitated deployment. Although the region's road and rail line systems were poor by US standards, intheater air and seaports of debarkation were among the most modern and capable in the world. As shown

in Table II-5, USCENTCOM's preferred seaport of debarkation was Ad Damman, Saudi Arabia, with 60 piers. The principal logistics support base in the AOR, it allowed cargo to be delivered directly into US military control, and it met USCENTCOM's goal of "delivering cargo as far forward as practical with the most efficient mode." The command's number two preference was Al Jubayl, Saudi Arabia, with 20 piers. The importance of keeping open the Strait of Hormuz during future operations in the region should be obvious from the Desert Storm experience, when nearly all of cargo shipped by sea transited the strategic choke point. Dhahran, Saudi Arabia, was the most active aerial port of debarkation for cargo and passengers followed by Al Jubayl, Riyadh, and King Fahd, Saudi Arabia. Saudi Arabia supplied extremely generous host nation support, particularly food, water, and petroleum products. The strategic lift provided by friendly governments and allies made a significant contribution to the deployment. Most importantly, Saddam Hussein's decision not to continue his drive south into Saudi Arabia in early August 1990 (due in part no doubt to the rapid deployment of US forces to the region, including two Navy carrier battle groups, two Army brigades, five Air Force fighter squadrons, and an Air Force strategic bomber wing by mid-month, as seen in Table II-2 and Appendix 2), and Iraqi inaction from the time of President Bush's decision to send troops on 7 August 1990 until 15 January 1991, provided USTRANSCOM and USCENTCOM a deployment time of 161 days prior to US offensive actions.[12]

DELIBERATE AND EXECUTION PLANNING

As the new USCINCCENT in November 1988, General Schwarzkopf began to reappraise the geopolitics in his AOR and structure his plans and forces accordingly. Iraq and Iran concluded a cease-fire to their eight-year war in the spring of 1989* and that November the Berlin Wall came down signaling both an end to the Soviet Union as a threat in Europe and a decline of Soviet influence in the Middle East. With a huge, well-equipped military, and a dictator bent on regional hegemony as its head of state, Iraq, General Schwarzkopf believed, had replaced the Soviets as the greatest threat in the Southwest Asia theater. As a result, in the fall of 1989 USCENTCOM, with the assistance of USTRANSCOM and the other supporting commands, began to revise USCINCCENT's Operation Plan (OPLAN) 1002-90 to reflect an Iraqi invasion of Kuwait and Saudi Arabia.[13]

To test the draft plan, USCENTCOM in July 1990 conducted a simulated joint exercise called Internal Look, which postulated an Iraqi attack on Saudi Arabia. In the simulation, US forces deployed and took up battle positions on Day 17. Although prophetic and in many ways a fortuitous event,** the exercise thus

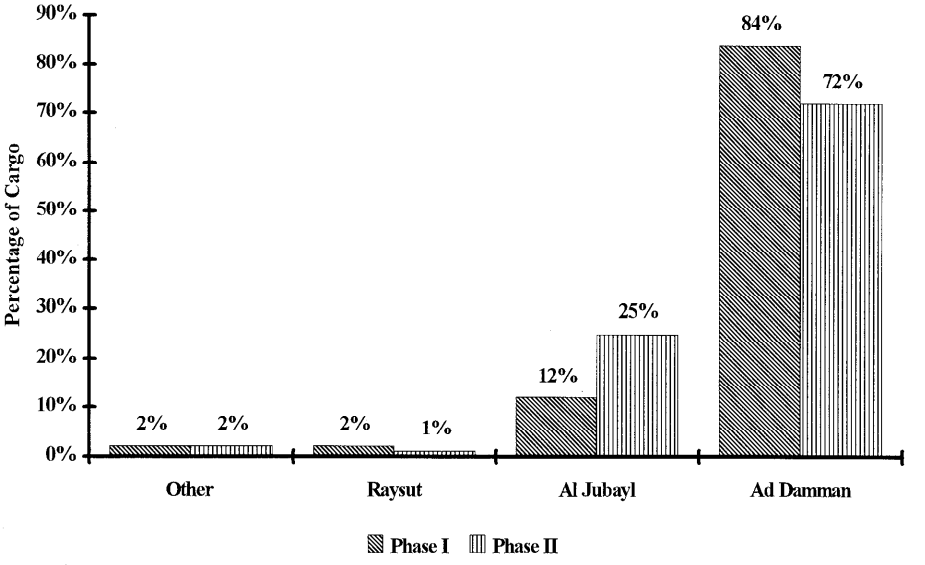
*Fighting between the two countries ended on 8 August 1988. The United Nations declared a cease-fire effective 20 August and peace talks continued into 1989.

**At the outset of Desert Shield, planners frequently remarked, "We did this during Internal Look."

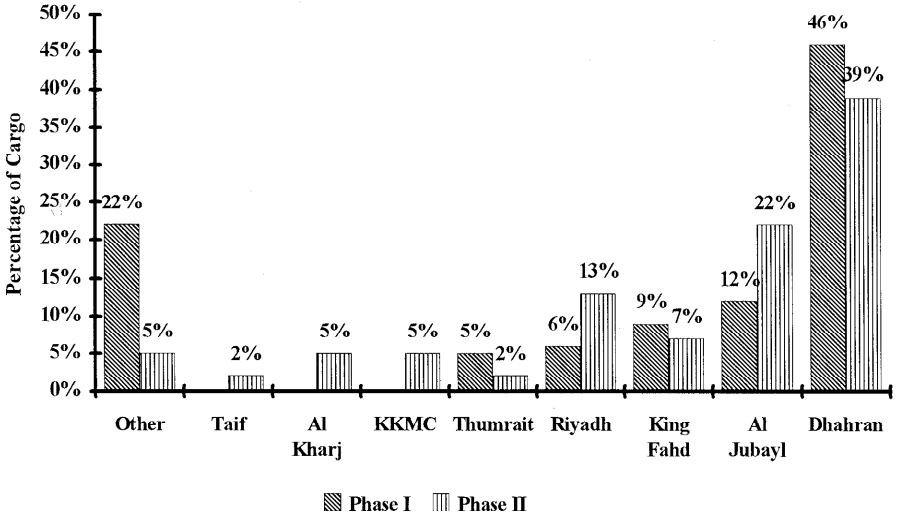
TABLE II-5

CARGO DELIVERED TO AREA OF OPERATIONS BY PORT

SEALIFT



AIRLIFT



SOURCE: USCENTCOM Briefing to CJCS, ca. March 1991.

conveniently skipped over perhaps the most critical phase of the operation: surge lift. Even with such a contrivance, Internal Look proved a sobering experience. Iraqi armor advanced as far south as Al Jubayl, over 1,200 miles into Saudi Arabia, before US forces seized the initiative. US airborne forces succeeded in holding Dhahran, Ad Damman, and the Abqaiq refineries but at a cost of nearly 50 percent dead or wounded. Internal Look underscored US heavy reliance on Saudi airports and seaports. Most importantly, the exercise demonstrated that a serious shortage of lift, in particular sealift, posed the greatest element of risk associated with a war in Southwest Asia. USCINCCENT's draft OPLAN 1002-90 was, in the words of USTRANSCOM deliberate planners, "not transportation feasible," meaning USTRANSCOM could not move the forces required to the USCENTCOM AOR in the allotted time.[14]

A cold start deployment greatly exacerbated the shortcomings identified in the draft operation plan. OPLAN 1002-90 drafters allowed for 30 days "warning time": 20 days to move to Saudi Arabia before Iraq attacked Kuwait and 10 more before US forces had to defend Saudi oil fields. In the real world Desert Shield scenario, however, there was no Joint Chiefs of Staff (JCS) warning order or alert order for 1002-90. (The JCS acknowledged its "Crisis Action procedures were not used effectively," which "resulted in some confusion." Details remain classified.) Without such wartime guidance or a peacetime charter, USTRANSCOM could not be proactive. For example, the command did not have the authority to offer the supported CINC and Chairman, JCS alternative transportation plans or courses of action, or to begin moving troops, ships, aircraft, or material handling equipment to airports and seaports of embarkation and debarkation in anticipation of deployment. Theoretically, as specified under the draft plan, when USTRANSCOM started deploying troops on 7 August, it was already between two to three weeks behind schedule.[15] Furthermore, draft OPLAN 1002-90 lacked refined Time Phased Force Deployment Data (TPFDD or "Tip-Fid"). Developed and executed using the Joint Operation Planning and Execution System (JOPES), the TPFDD identified the scheme of deployment, including the sequence in which specific units deployed. In the case of USCINCCENT's draft plan, the TPFDD listed equipment phased out years earlier and did not include the most modern equipment. The TPFDD also scheduled moves of units that no longer existed.[16]

Lack of warning, an immature operation plan, an unrefined TPFDD, and other JOPES-related problems combined to make for a chaotic situation. Operated and maintained by USTRANSCOM for the Joint Deployment Community (JDC), JOPES was a new system, untried in a real world contingency.* Between 1989

*The supported and supporting CINCs decided not to use JOPES during Operation Just Cause, the US invasion of Panama in December 1989. According to General Johnson, Just Cause began "in the 'Special Access Required (SAR)' channels through MAC and was almost an exclusive MAC deployment. I was new, unenlightened, and did not fully appreciate the need to use JOPES....No one had used it before, and certainly, the MAC staff wasn't interested in advising me to involve USTRANSCOM....After Just Cause I promised the USTRANSCOM staff that

and 1991, USTRANSCOM merged two deployment systems--the Joint Operation Planning System (JOPS) and the Joint Deployment System (JDS)--to form a single system, JOPES, for deliberate and execution planning. Part of the JCS Worldwide Military Command and Control System (WWMCCS), JOPES was DOD's primary macro-level transportation management system, allowing theater commanders and major commands to communicate requirements and sort out priorities. Considered by users to be "not user friendly" but "adequate" for peacetime deliberate planning, the system gridlocked in execution planning just as the deployment got underway. On 10 August, Strategic Air Command (SAC), for example, sought permission from the Joint Staff to use messages in lieu of JOPES to request airlift from MAC and USTRANSCOM because the system "is not responsive to our urgent needs and currently has our operators locked out...failure to provide the timely alternative will impact on our ability to support the Persian Gulf."[17]

The rapidly evolving situation in the AOR required USCENTCOM to repeatedly change the priority and scheduling of units. Between 13 and 16 August, the 82d Airborne Division priority dropped from first to twentieth, and on one day that week USCENTCOM changed its airlift priorities seven times. During the first three days of September, the 101st Airborne Division cancelled 28 C-5 and 25 C-141 missions. Additionally, a multitude of users with access to the system manipulated data making it impossible to validate requirements. Given its level of development, JOPES was not capable of reacting to changes of such frequency and magnitude.[18]

The impact was immediate. At times nobody at an airport knew why an aircraft had arrived. Other times MAC deployed the wrong type of aircraft or too many or too few aircraft for loads awaiting them. (Airlift requester misuse of the terms "oversize" and "outsize" cargo contributed to the problem. See "Civil Reserve Air Fleet," this chapter.) In one case, MAC sent an aircraft to pick up a medical unit in Oklahoma that was not ready to move. The lift was wasted. "Early in the conflict," General Johnson recalled, "we had a requirement at Shaw Air Force Base [South Carolina] for passengers....We flew two commercial aircraft in to carry them [to the AOR]. When the aircraft got there, they found a load for only one of them. In this case we had two deadheaded legs, from Paris to the CONUS [continental United States] and return. We, as a command and as a nation, cannot afford the expense of doing business that way."[19]

A lack of training in the operation of JOPES contributed greatly to mistrust of the system.[20] According to General Johnson,

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they would be involved in any future transportation activities and the USTRANSCOM SAR capability was greatly enhanced. (SOURCE: Speech (U), H. T. Johnson to MORS Conference, "JOPES to MORS," Washington, D.C., 26 Sep 95.)

> the initial units to move, the 1st Tactical Fighter Wing and the 82d Airborne, were not JOPES literate, had never used it real-world, didn't want to use it--and didn't. The 82d Airborne was to move its Ready Brigade. No matter how hard we tried to complete their move, the 82d Airborne would add more items. I could not criticize them because they were going into an uncertain situation and wanted much more support than was in their [planned] package. I facetiously said we would know we had completed the Ready Brigade move when the 'Fayetteville Chamber of Commerce showed up to load!'...Because of this 'lack of faith' in JOPES, a decision was made to simply flow airlift into Langley [AFB, Virginia], [Fort] Bragg [North Carolina], and a few other places, at the rate of one airlifter per hour. The rule of engagement was whoever and whatever is there when the C-141 or C-5 taxies up gets loaded and goes to Saudi. Data on units, equipment, and supplies being moved was being input into JOPES, but wasn't used; the idea was to move cargo/people *first* and then let JOPES catch up.[21]

Air Force Major General Malcolm B. Armstrong, Special Assistant to the Director of the Joint Staff, in his report "Implications for TRANSCOM Based on Desert Shield Observations," also concluded that JOPES-related problems stemmed from unfamiliarity with system operation. He told General Powell that military organizations:

> do not use this system for day-to-day peacetime activities. In peacetime, each component manages [its] portion of the nation's mobility capability using processes that are service oriented and predate both TRANSCOM and the notion of jointness. Thus, JOPES procedures and shortfalls were not well understood due to a lack of experience in working with JOPES. As problems arose, there was a tendency for JOPES users to abandon the process and revert to that which they were familiar with--their day-to-day systems. However, the day-to-day, peacetime management systems do not provide crucial information needed to manage a wartime deployment.[22]

Even senior officers circumvented the system. Air Force Major General Vernon J. Kondra admitted he "went around" JOPES and USTRANSCOM when he took over as MAC's Deputy Chief of Staff of Operations on 23 August 1990. "As far as I was concerned," he recorded in his oral history following the war, "they were another layer, so I'd go straight to EUCOM [US European Command] or straight to [US]CENTCOM." General Johnson recalled "the USTRANSCOM staff telling MAC which missions to fly first meeting with extreme resistance even when the order came from CINCTRANS who was also CINCMAC [and] the

CENTCOM staff similarly viewed JOPES as an overly bureaucratic tool that had no place in a real war." Such attitudes and behavior, wide-spread early in Desert Shield, cut USTRANSCOM out of the process and consequently the supported CINC and the Joint Staff lost visibility over deployment requirements.[23]

The problem persisted throughout the deployment. In mid-November, the Air Force's Directorate of Logistics went to MSC and MTMC in an attempt to modify sealift billing and port handling rates, which prompted USTRANSCOM's Directorate of Operations and Logistics to remind the Air Staff that Desert Shield/Desert Storm transportation accounting was USTRANSCOM's responsibility and in the future "transportation policy issues should be addressed directly to USTRANSCOM." On 16 February 1991, General Schwarzkopf told his component commanders that "since 16 January our personnel strength [intheater] has increased by 71,800 and now stands at 525,920. I am concerned that 20 percent of that increase [14,360] was not in the TPFDD and therefore unplanned and invisible to this headquarters." It was clear to him "that some enterprising individuals are simply finding ways to get to the war by any means." Consequently, he imposed a theater ceiling of 530,000 "effective immediately," ordered that "every unit or individual deploying to this theater...be assigned a unit line number (ULN) in the TPFDD," and directed USTRANSCOM "not to flow any unit or individual unless they are so identified."[24]

USCENTCOM and USTRANSCOM worked together to restore user confidence in the system and bring order to the deployment. In early August, the commands reinforced via message and phone calls the dire need for all Defense Transportation System (DTS) users to follow JOPES procedures. Also, USTRANSCOM sent its JOPES experts to USCENTCOM Rear (MacDill Air Force Base, Florida) and to the supporting CINCs' headquarters. On the spot these Technical Assistance Teams helped unified and specified command execution planners operate JOPES and refine the TPFDD data base.[25]

USCINCCENT in mid-month began "freezing" the TPFDD daily. Authorizing only USCENTCOM to make changes,* the freezes helped to stabilize the airlift and facilitate deployment data refinement. Once refined, the TPFDD provided a foundation for system discipline, enhanced deployment procedures, and enabled JOPES to begin functioning as designed. With JOPES back on line on 24 August, USTRANSCOM could give the Joint Staff and supported CINC a new and improved perspective on total deployment requirements.[26] General Kondra, and much of the Joint Deployment Community, soon came to the same conclusion: operating outside of JOPES and USTRANSCOM "was a dumb way to do business." Throughout the remainder of the operation, he went directly to

*Unauthorized changes, those not validated by the supported CINC, remained a problem throughout the deployment. (SOURCE: Intvw (U), James K. Matthews, with Lt Col Ralph Alexander, TCJ3/J4-JPG, 1 Jul 94.)

USTRANSCOM and said, "I've got this problem with CENTCOM--fix it. That's what they were getting paid for, that was their job."[27]

USTRANSCOM improved execution planning in other ways. In October the command deployed a USTRANSCOM Forward Element to the AOR, which improved communication, coordination, visibility, and transportation system responsiveness. Additionally, the command accelerated development of the Dynamic Analysis Replanning Tool (DART). A suite of hardware and software for rapidly editing transportation scheduling data and analyzing courses of action, DART included elements of JOPES Version 4, JOPES' most advanced and yet-to-be released software. USTRANSCOM deployed a DART prototype to USEUCOM in November, which used it to modify and manipulate the Desert Shield/Desert Storm TPFDD and develop courses of action during the second phase of the operation. DART proved such a success that USTRANSCOM intended to use it for redeployment and, in the near future, make it available to the other unified commands. Similarly, USTRANSCOM accelerated the development and brought on line the Flow and Analysis System for USTRANSCOM that rapidly (within two to four hours) and accurately provided USCINCTRANS with transportation requirements and USCINCCENT with closure estimates.[28]

USTRANSCOM learned several lessons about planning activities from its experiences in the Desert Shield/Desert Storm. In general, the deployment reinforced the importance of deliberate planning in war plan preparation and the necessity for transportation experts to be involved in the earliest stages of supported CINC execution planning. General Johnson emphasized that the deployment community must maintain current, refined deployment data to avoid the confusion experienced early in the Desert Shield deployment. He pointed out that, due much to lack of interest on the part of the regional CINCs, there had been only one TPFDD refinement conference (for the Commander in Chief, United States Pacific Command) since 1989, while General Schwarzkopf concluded that "light forces are not light--all units required more lift than the planning process predicted."[29] More importantly, JOPES, once loaded with a refined TPFDD, proved crucial to Desert Shield/Desert Storm deployment order and discipline. According to USCENTCOM's Director of Operations (CCJ3), the Joint Deployment Community "would never have been able to achieve the remarkable successes of Operation Desert Shield without JOPES. Originally designed to solve the seemingly insurmountable problems encountered during Nifty Nugget, JOPES appears now to have come of age and will, in the future, be an essential part of all deployment operations." The supported CINC's chief operator listed two primary problems with JOPES: lack of accessibility to WWMCCS terminals and high-speed printers in the field, and system interfaces and execution software limitations, especially in the scheduling and manifesting process. USCENTCOM believed the DTS needed "a single deployment system integrated to the unit level and used by everyone in the transportation

community," which would help solve systems interface and software problems. "At a minimum," the CCJ3 continued, "each ALCE [Airlift Control Element] should have a deployment system terminal, high-speed printer, and 24-hour JOPES (or whatever new joint system is developed) experience."[30]

General Johnson echoed USCENTCOM's JOPES assessment, but with a twist: "I cannot conceive of doing any large deployment without a JOPES-like system. Most people who say they don't require JOPES are fooling themselves. JOPES has the same shortcomings common to any computer-based system. The old adage applies: garbage in-garbage out. JOPES is only as good as the data that's put in it."[31] Consequently, USCINCTRANS stressed how important it was for the supported CINC to make clear, early decisions on movement requirements, validate those requirements, and periodically freeze the TPFDD to allow planners to gain control of the airlift flow to meet the validated requirements. Additionally, he recommended that DOD maintain funding for incremental JOPES software revisions to strengthen interfaces and enhance user friendliness, and make those who would use the system in war use it in peace as well. "Train, train, train, use, use, use" was the "real key to success with JOPES" according to General Johnson.[32] However, under USTRANSCOM's charter, USCINCTRANS did not have the peacetime authority to direct the Joint Deployment Community to use JOPES and JOPES-compatible processes, such as USTRANSCOM's new intransit visibility system, the Global Transportation Network (GTN).

INTRANSIT VISIBILITY

Following the war, General Johnson outlined his concept of GTN and its relationship to JOPES:

> Ultimately, the Global Transportation Network will be *the* automated data processing system for US Transportation Command. We will still have something like JOPES...for various operation plans. But you have to have a way of communicating the transportation requirement from JOPES to the mode operator. Then you have to follow the shipment, advise a customer when it is arriving, and provide feedback. GTN will do that. But in doing so, it will allow us to have total asset visibility, at least for the time the cargo is in the transportation system. It allows us to execute our missions with better, more timely information. It allows everybody in the system to know the same thing at the same time.[33]

Arguably, the most common complaint registered by DTS users during and following Desert Shield/Desert Storm was lack of intransit visibility (ITV).[34*]

*See "Airlift Sustainment Cargo Backlog" and "Aeromedical Airlift, Planning, and Regulation" this chapter, and "Special Middle East Sealift Agreement," Chapter VI.

With the capability to identify and track cargo and passengers en route, from origin to final destination, ITV offered tremendous benefits to warfighters. With it they could foretell lift requirements with greater precision and accuracy. Real-time verification of cargo location would instill confidence in system users, thus sharply reducing unnecessary reordering of equipment and supplies. Consequently, scarce lift resources would be freed to carry truly critical cargo. Visibility over the aeromedical evacuation system would save lives and speed recovery by helping doctors and transporters more accurately match patient requirements with hospital capabilities. Knowing exactly what and who was on aircraft and ships lost to hostile action would be invaluable to the theater commander and other decision makers.* ITV would give them the capability to reduce the flow, stop the flow, speed the flow, or redirect the flow of cargo and troops depending on the turn of battle. Thus ITV would be a force multiplier. With the confidence they gained in their transportation system, through ITV, the supported and supporting CINCs could move more swiftly and act more decisively. Stated conversely, lack of ITV could lead to increased uncertainty about force deployments and resupply movements and thus inhibit decision makers from seizing advantages in battle.

For several related reasons, the US military's intransit visibility capability was virtually nonexistent during Desert Shield/Desert Storm. DOD transportation systems, numbering in the dozens, lacked interfaces and data standardization. In essence, the various service systems--for lack of common language and software, and hardware connectivity--were, for the most part, mutually unintelligible. The Air Force Inspector General described the ramifications from his service's perspective:

> Air Force customers [of DTS] had control numbers for use in the Consolidated Aerial Port Subsystems (CAPS) to track cargo in the airlift system. However, Air Force customers often could not use Air Force control numbers to track cargo in the sealift system. Whenever Air Force cargo was containerized, MTMC assigned new control numbers for use in the Transportation On-Line System. The new control numbers did not easily cross refer to the numbers Air Force customers had. These conditions, coupled with limited Air Force presence at seaports and heavy seaport workloads, made it difficult or impossible to track Air Force cargo in the sealift system. The lack of visibility weakened customer confidence and resulted in the same item being ordered multiple times and in multiple ways....Without improvements in intransit visibility, users are likely to lack confidence in sealift during the next contingency as they did in Operation Desert Storm.[35]

*See "Desert Shield Force Closures," Chapter IV, and especially Table IV-1 for an understanding of the confusion such a loss could cause the supported CINC.

Lack of document discipline and slow, partial, inaccurate, and generally lackadaisical data entry were also major impediments to intransit visibility in the DTS, all of which stemmed from the same problem that had created the multitude of service transportation systems that could not talk to each other: nobody in DOD had control or oversight of the ITV process. Consequently, nobody was accountable for mistakes. Most importantly, nobody had the authority to plan, program, and budget for an ITV system and bring it on line for the entire DOD.[36]

In spite of the odds, USTRANSCOM and its component commands provided DTS users with a modicum of intransit visibility during Desert Shield/Desert Storm. USTRANSCOM and MAC developed interfaces between JOPES and MAC's Global Decision Support System (GDSS), and as a result, JOPES, for the first time ever, presented "actual" carrier movement schedules with "real" manifests attached for movement tracking. Another USTRANSCOM initiative sent MAC teams to airlift onload locations. Primarily via the GDSS and the Automatic Digital Network (AUTODIN), the MAC teams reported to USTRANSCOM what was loaded on departing aircraft. According to General Johnson, the success of these "never before attempted interfaces underscores the potential gains achievable by networking existing systems."[37] Likewise, USCENTCOM considered them a tremendous help during the deployment.[38]

Additionally, MAC moved Remote Consolidated Aerial Port Subsystems (RCAPS) terminals to aerial ports in the United States and AOR. A deployable, more flexible version of the command's CAPS, RCAPS provided users access to cargo and passenger manifest information using personal computers and local area networks tied to CAPS long-haul lines and the Defense Data Network (DDN). Stop gap solutions during war, however, were not the cure for DOD intransit visibility shortcomings.[39]

As mentioned above, prior to Desert Shield/Desert Storm USTRANSCOM had under development an ITV system--the Global Transportation Network--which held great promise. At war's end, the command had fielded a prototype to manifest troops returning from the AOR. It had also completed a GTN concept of operations and established a management structure to support system development. GTN, as envisioned, would be the primary ITV system for the DTS. It would collect, consolidate, and integrate the status and location of military cargo, passengers, patients, and lift assets from multiple DOD and commercial transportation systems. Updated on a recurring basis, GTN would serve as the central repository of real-time movement data for DTS requisitioners, suppliers,. operators, and transportation managers and planners. With a redundant, continuity-of-operations capability, it would also be accessible from terminals deployed to en route and intheater stations. Producing a system such as GTN was USTRANSCOM's responsibility, as specified in the command's implementation plan.[40] "Transportation systems are joint...they ought to be managed in a joint fashion," General Armstrong reminded his boss, Air Force

Lieutenant General Michael P. C. Carns, Director of the Joint Staff. But, he added, unless USTRANSCOM had peacetime authorities to enforce system compatibility, data standardization, training, and document and data entry discipline, transportation systems--like GTN and JOPES--would likely be unable to meet warfighter needs and expectations.[41]

Major General Vernon J. Kondra, USAF
Deputy Chief of Staff of Operations, Military Airlift Command
August 1990-July 1991

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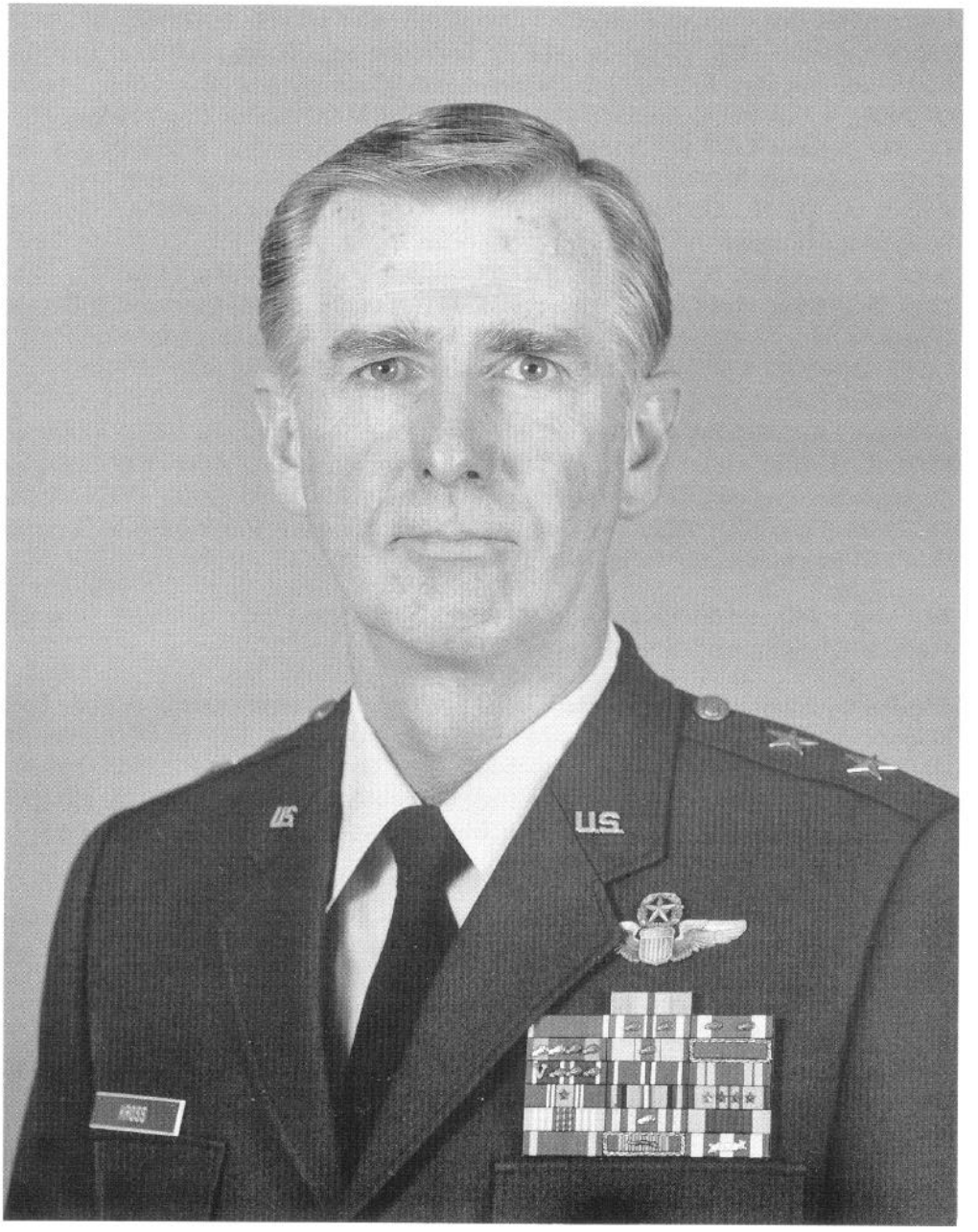

Major General Walter Kross, USAF
Director of Operations and Logistics
United States Transportation Command
June 1990-July 1991

CHAPTER III

AIRLIFT

OVERVIEW

As directed by United States Transportation Command (USTRANSCOM), Military Airlift Command (MAC) managed the Desert Shield/Desert Storm strategic airlift. MAC's active duty force joined with MAC-gained aircraft and crews from the Air Force Reserve (AFRES) and Air National Guard (ANG) to make up a total strategic airlift force of 110 C-5s and 234 C-141s. During the operation, this organic airlift force was supplemented by Strategic Air Command (SAC) KC-10 tanker/cargo aircraft and Navy C-9s (nine aircraft loaned to MAC in January for transport from Europe to the Persian Gulf). As shown in Table III-1,[1] US military aircraft flew 12,894 strategic airlift missions in support of Desert Shield/Desert Storm. Missions flown in the common-user role follow by aircraft type: C-141 (8,536); C-5 (3,770); KC-10 (379); and C-9 (209). Commercial airline augmentation was crucial. On 3,309 missions, commercial aircraft delivered 321,005 passengers and 145,225 tons of cargo, as seen in Table III-2. That equaled 64 percent and 27 percent respectively of the total passengers (500,720) and cargo (543,548 tons) carried via strategic airlift during Desert Shield/Desert Storm.[2] Based on USTRANSCOM's Desert Shield/Desert Storm experience, Department of Defense (DOD) planners should count on carrying roughly one ton of cargo by air for each troop deployed. Passenger and cargo totals in Table II-1 differ slightly from those in Table III-2 because they are based on a different source. Table II-1 statistics are based on USTRANSCOM Situation Reports, the most authoritative source for overall lift information. However, the Situation Reports do not break out cargo and passengers by aircraft type. To portray that level of detail, as shown in Table III-2, the authors had to tap MAC's Military Air Integrated Reporting System (MAIRS) data bank.

OPERATIONS

US Strategic Airlift Fleet. During Desert Shield/Desert Storm, MAC had two types of strategic airlift aircraft under its command, the C-5 Galaxy and the C-141 Starlifter. One of the two largest aircraft in the world (the Soviet AN-224 Condor was slightly larger), the C-5 was almost as long as a football field and as high as a six-story building. With a wingspan of 222 feet and a cargo compartment comparable to an eight-lane bowling alley, the C-5 could transport virtually any piece of Army combat equipment, including tanks, helicopters, and the 74-ton mobile scissors bridge. It could be loaded and offloaded at the same time using the front and rear cargo openings. A kneeling landing gear system and a visor nose and a rear door, each with full-width ramps, opened to expose the full height and width of the cargo compartment permitting

drive-through loading and unloading of wheeled and tracked vehicles. The entire cargo floor was equipped with a roller system for rapid handling of palletized equipment. Its four turbofan engines could move the aircraft at more than 500 miles per hour at 34,000 feet. Fully fueled, it could carry a load of 204,904 pounds 2,150 nautical miles, offload, and fly to a second base 500 nautical miles away from the original destination without aerial refueling. With aerial refueling, crew endurance was the only limit to the aircraft's range. The C-5 had six crew members: pilot, co-pilot, two flight engineers, and two loadmasters.[3]

The C-141 was the military airlift workhorse of Desert Shield/Desert Storm. Looking much like its larger partner--both the C-141 and C-5 had the distinctive high T-tail, 25-degree wing sweep, and four engines mounted on pylons beneath the wings--the Starlifter, with its changeable cargo compartment, could transition from rollers on the floor for palletized cargo to a smooth floor for wheeled vehicles to aft facing seats or sidewall canvas seats for passengers, quickly and easily, to handle 30 different missions. For example, it could be configured to carry any one of the following loads: 200 troops, 155 airborne troops, 103 litters and 14 seats, or 68,725 pounds of cargo. With a 160-foot wingspan and nearly 170 feet long and 40 feet high, the aircraft could reach 500 miles per hour at 25,000 feet. Like the C-5, the C-141 was aerial refueling-capable and had a crew of six.[4] Built between 1963 and 1967, the C-141 at the outset of Desert Shield was reaching the end of its programmed serviceable life. Even so, it delivered 159,462 tons of cargo, 30 percent of the cargo airlifted during the operation. The Starlifter and Galaxy together accounted for 361,147 tons, or 66 percent of the cargo airlifted in support of Desert Shield/Desert Storm.

MAC launched the first airlift mission of the operation on 7 August, a C-141 assigned to the 437th Military Airlift Wing, Charleston Air Force Base (AFB), South Carolina. The Starlifter, tail number 67-0016, arrived at Dhahran, Saudi Arabia, on the 8th carrying cargo and passengers for the command's Airlift Control Element (ALCE). By the end of the day, all the ALCEs--carried on 37 C-141, 10 C-5, and 10 C-130 missions--were in place to manage the airlift flow, and they were soon put to the test. By mid-August, C-5s and C-141s, along with aircraft volunteered by the airlines, were flying what became known as the "aluminum bridge." During Phase I operations--which commenced on 7 August (C-Day) and ended 96 days later, at midnight, 10 November 1990 (C+95)--airlift missions in support of Desert Shield averaged about 65 per day.[5] As shown in Tables III-1 and III-2, the rate of C-141 missions slowed in September and October as the airlift shifted from unit deployment to sustainment, which allowed resumption of scheduled maintenance and gave crews a chance to rest. The greatly increased number of C-141 missions in December and January reflected wartime tempo deployment. During this period, up to 127 airlift planes* landed daily in Southwest Asia, averaging one arrival every 11 minutes.[6]

*The peak day was 17 January: 28 C-5, 66 C-141, 12 C-9, and 21 commercial aircraft.

To meet the massive requirement, MAC took extraordinary measures. The command stopped unit aircrew training and waived the requirements for the crew duty day and crew maximum flying time. It also waived aircraft home station maintenance requirements, stopped depot maintenance, and even put aircraft stripped for painting into the airflow.[7]

TABLE III-1

DESERT SHIELD/DESERT STORM STRATEGIC AIRLIFT MISSIONS COMPLETED BY AIRCRAFT TYPE

(As of 10 March 1991)

	C-141								
	DS/DS	DE	EE	TOTAL	C-5	C-9	KC-10	COML	TOTAL
Aug 90	1,041	--	--	1,041	415	--	17	195	1,668
Sep 90	952	--	--	952	510	--	89	322	1,873
Oct 90	676	2	--	678	440	--	57	246	1,421
Nov 90	729	30	--	759	426	--	48	269	1,502
Dec 90	1,391	31	24	1,446	567	--	118	606	2,737
Jan 91	1,666	33	31	1,730	699	73	50	720	3,272
Feb 91	1,560	29	28	1,617	552	126	0	757	3,052
Mar 91 (1-10 Mar)	294	10	9	313	161	10	0	194	678
TOTAL	8,309	135	92	8,536	3,770	209	379	3,309	16,203

DE - Desert Express (Start date 30 Oct 90; Discontinued 20 May 91)
EE - European Desert Express (Start date 8 Dec 90; Discontinued 14 Mar 91)

SOURCE: US Transportation Command Situation Reports (SITREPs).

TABLE III-2

DESERT SHIELD/DESERT STORM STRATEGIC AIRLIFT SUMMARY COMPLETED BY AIRCRAFT TYPE (CARGO IN SHORT TONS)

(As of 10 March 1991)

		C-141							
		DS/DS	DE	EE	TOTAL	C-5	KC-10	COML	TOTAL
Aug 90	Passengers	19,353	--	--	19,353	20,956	102	32,559	72,970
	Cargo	19,663	--	--	19,663	23,437	407	8,948	52,455
Sep 90	Passengers	7,860	--	--	7,860	13,259	112	37,274	58,505
	Cargo	18,772	--	--	18,772	31,698	3,491	14,001	67,962
Oct 90	Passengers	2,138	--	--	2,138	7,753	102	39,779	49,772
	Cargo	12,445	2	--	12,447	25,895	1,816	10,727	50,885
Nov 90	Passengers	4,041	--	--	4,041	3,138	141	13,111	20,431
	Cargo	12,519	235	--	12,754	1,586	9,362	9,362	33,064
Dec 90	Passengers	18,988	--	--	18,988	13,541	519	85,126	118,174
	Cargo	26,147	399	375	26,921	34,355	3,520	27,425	92,221
Jan 91	Passengers	28,664	--	--	28,664	16,443	135	69,874	115,116
	Cargo	32,398	580	488	33,466	43,108	1,309	33,502	111,385
Feb 91	Passengers	6,661	--	--	6,661	8,133	0	29,699	44,493
	Cargo	29,434	637	442	30,513	34,035	0	33,603	98,151
Mar 91	Passengers	5,421	--	--	5,421	1,162	0	13,583	20,166
(1-10 Mar)	Cargo	4,577	213	136	4,926	7,571	0	7,657	20,154
TOTAL	Passengers	93,126	--	--	93,126	84,385	1,111	321,005	499,627
TOTAL	Cargo	155,955	2,066	1,441	159,462	201,685	19,905	145,225	526,277

DE - Desert Express (Start date 30 Oct 90; Discontinued 20 May 91)
EE - European Desert Express (Start date 8 Dec 90; Discontinued 14 Mar 91)

SOURCE: Military Air Integrated Reporting System (MAIRS) Database, Military Airlift Command, Operations and Transportation, Command Center Reports (MAC/XOCR).

TABLE III-3

CUSTOMER SERVICE

PASSENGERS: TOTAL BY CUSTOMER

USER	AUG 90	SEP 90	OCT 90	NOV 90	DEC 90	JAN 91	FEB 91	TOTAL
ARMY	32,767	38,805	43,971	14,725	72,683	63,688	17,558	284,197
USAF	12,835	6,365	1,420	1,344	3,563	9,487	1,297	36,311
NAVY/MC	19,523	10,498	2,279	1,675	25,730	21,329	4,255	85,289
CENTCOM	664	1,503	90	459	285	3,164	1,037	7,202
CHANNEL	84	2,624	2,208	4,160	7,576	16,157	17,149	49,958
MAC	2,864	437	30	284	1,273	2,371	2,365	9,624
TOTAL	68,737	60,232	49,998	22,647	111,110	116,196	43,661	472,581

SOURCE: RAND Study (U), An Assessment of Strategic Airlift Operational Efficiency, (R-4269/4-AF), 1993.

CUSTOMER SERVICE

CARGO: TOTAL SHORT TONS BY CUSTOMER

USER	AUG 90	SEP 90	OCT 90	NOV 90	DEC 90	JAN 91	FEB 91	TOTAL
ARMY	23,153	23,258	14,144	8,580	28,162	28,995	18,418	144,710
USAF	11,995	19,028	11,751	3,962	8,410	13,939	14,833	83,918
NAVY/MC	11,818	11,161	2,666	1,975	11,388	13,475	6,739	59,222
CENTCOM	699	3,141	158	283	808	8,892	2,035	16,016
CHANNEL	251	13,330	21,914	35,046	38,430	42,075	52,671	203,717
MAC	1,967	559	137	901	2,820	1,229	1,402	9,015
TOTAL	49,883	70,477	50,770	50,747	90,018	108,605	96,098	516,598

SOURCE: RAND Study (U), An Assessment of Strategic Airlift Operational Efficiency, (R-4269/4-AF), 1993.

Early in the deployment it became apparent that USTRANSCOM needed additional aircraft to meet requirements and the US airline industry was quick to respond. The first volunteer commercial aircraft flew on 8 August in support of Desert Shield, and within days the volunteer civilian force numbered 30 aircraft--15 passenger and 15 cargo--from 16 Civil Reserve Air Fleet (CRAF) members, as seen in Table III-4. Then, on 17 August, Commander in Chief, USTRANSCOM (USCINCTRANS), Air Force General Hansford T. Johnson activated Stage I of the CRAF program, which guaranteed USTRANSCOM the use of an additional 17 Long Range International (LRI) passenger and 21 LRI cargo aircraft. An arrangement dating from 1951 in which commercial airlines agreed to make aircraft available for DOD deployments in exchange for peacetime military business, CRAF had never before been activated. Representing three percent of the US commercial fleet, these 38 aircraft (which MAC intentionally took from 16 different airlines to help spread the economic hardship they might face by removing their aircraft from the commercial market) gave USTRANSCOM an additional daily airlift capacity of 1,920 passengers and 490 tons of cargo. CRAF Stage I emphasized movement of troops to "marry-up" with prepositioned cargo overseas.[8]

TABLE III-4

CIVIL AIR CARRIER VOLUNTEERS PRIOR TO CRAF STAGE I ACTIVATION

American Trans Air	Hawaiian Airlines*
Air Transport International	Pan American World Airways
Continental Airlines	Emery/Rosenbalm Aviation
Connie Kalitta	Southern Air Transport
Delta Airlines*	Trans International Airlines*
Eastern Airlines*	Tower Air
Evergreen International Airlines	United Airlines
Federal Express	World Airways

*Volunteers who did not have a Stage I commitment.

SOURCE: Memo (U), MAC DCS Plans and Programs/XPXO, "Air Carrier Volunteers Prior to CRAF Stage I Activation," n.d., as cited in MAC Annual History, 1 Jan-31 Dec 90.

With 412 strategic airlift aircraft (68 civilian and 344 military), USTRANSCOM completed the largest unit deployments ever via air. From 8 to 26 August, the command airlifted the 82d Airborne Division to Saudi Arabia on 244 C-141, 100 C-5, and 40 commercial flights. Moreover, it moved simultaneously to the area of operations the 101st Airborne Division (between 17 August and 25 September) on 55 C-5, 62 C-141, and 29 commercial missions and the 1st

Marine Expeditionary Brigade (from 25 August to 22 September) on 117 C-5, 33 C-141, and 20 commercial missions (see Table II-2).[9]

Supporting the President's call for additional forces just prior to hostilities and to help ensure a steady stream of resupply, Secretary of Defense Richard B. "Dick" Cheney, acting on General Johnson's request of the previous day, activated Stage II of CRAF on 17 January 1991. Stage II provided USTRANSCOM access to a total of 76 LRI passenger and 40 LRI cargo aircraft. Of these, the command was primarily interested in the cargo aircraft. With the 40 cargo aircraft and 38 others volunteered for service by the airlines, the command eliminated a massive backlog of air-eligible Desert Shield/Desert Storm sustainment cargo (see "Airlift Sustainment Cargo Backlog," this chapter). Under CRAF Stage II, USTRANSCOM could also call on the following aircraft: 23 Short Range International (SRI) passenger, 38 domestic cargo, and 4 Alaskan cargo.[10]

The military seriously considered activating CRAF Stage III to tap its cargo and aeromedical assets. On 21 January 1991, with the air war well under way and the C-141 and C-5 forces stretched to their maximum, General Johnson told the Chairman, Joint Chiefs of Staff (CJCS), that USTRANSCOM had "an airlift shortfall for already-validated, rapidly emerging requirements." CRAF Stage III included the following additional aircraft: 110 LRI cargo, 176 LRI passenger, 38 aeromedical, 25 SRI passenger, and 51 cargo (SRI, domestic, and Alaskan). However, USCINCTRANS wanted only 31 of the LRI wide-body cargo aircraft as follows: Federal Express (6), Northwest (2), Pan American World Airways (6), United Parcel Service (2), Evergreen International Airlines (6), Emery/Rosenbalm (6), and World Airways (3). Facing the possibility of a bloody ground war and believing that USTRANSCOM would be unable to spare C-141 aircraft for aeromedical airlift operations, the Air Staff also wanted MAC to have access to Stage III's 35 aeromedical aircraft should DOD need them. As it turned out, the short duration of the war and a rapidly diminishing backlog of air-eligible cargo made activation of CRAF Stage III unnecessary.[11] As General Johnson emphasized, "Stage III is for national emergencies, and Desert Shield didn't fit that category."[12]

Five tables and one appendix detail the contributions of commercial airlines to Desert Shield/Desert Storm. Showing by month the total passengers and cargo transported by commercial carriers, Appendix 3 and Tables III-1 and III-2 highlight the commercial sector's tremendous contribution under CRAF Stage II. For instance, with Stage I assets MAC moved 77,053 passengers in September and October. That compares to 155,000 passengers in December and January under Stage II. In January and February, under Stage II, commercial airlines carried 67,105 tons compared to 24,728 tons in September and October Stage I operations.[13]

Tables III-5 and III-6 show by airline and Stage the number of LRI passenger and LRI cargo aircraft obligated to MAC under CRAF. Upon activation of Stage II, 14 airlines had 76 LRI passenger aircraft committed to the program. Four of those--United (21), Northwest (14), Trans World (12), and Pan American World Airways (10)--had 57 aircraft committed equaling 75 percent of the total. Upon activation of Stage II, 13 airlines had 40 LRI cargo aircraft committed to the program. At that point, by far the largest participant for cargo hauling was Federal Express with 14 aircraft equaling 35 percent of the total. Emery/Rosenbalm's commitment of seven aircraft was the next largest in the Stage II LRI cargo category.[14]

As seen in Appendix 3, by war's end 34 airlines had made significant contributions to the lift while several others had also participated (code: 999 other). Five companies carried more than 10,000 tons: Federal Express (33,825), Northwest Airlines (19,078), Pan American World Airways (12,419), Evergreen International Airlines (12,185), and American Trans Air (11,818). Six companies carried more than 30,000 passengers: Northwest Airlines (63,155), American Trans Air (61,740), Pan American World Airways (51,900), Trans World Airlines (46,046), Tower Airlines (41,906), and United Airlines (35,150). Thus three airlines--Northwest Airlines, Pan American World Airways, and American Trans Air--stand out among all the others for their contributions to both cargo and passenger transport. World Airways, carrying 9,002 tons and 24,448 passengers was also a major participant in the deployment.[15]

Federal Express' role was also exceptional. That company carried 19.8 percent of all the cargo delivered by US airlines in support of Desert Shield/Desert Storm. Northwest carried the second largest amount, 11.1 percent of the total commercial sector tonnage.[16]

Table III-7 depicts roles played by commercial aircraft type. MAC listed nine types as making significant contributions to Desert Shield/Desert Storm. The obvious workhorse of the operation was the wide-body Boeing 747. It carried 108,536 tons and 262,195 passengers representing 63.4 percent and 64.7 percent, respectively, of the total tonnage and people moved by US commercial aircraft during Desert Shield/Desert Storm. Ranking numbers two, three, and four in tons transported were, in descending order, the Douglas DC-8 (29,296), Lockheed L-1011 (14,939), and Douglas DC-10 (12,287). Ranking numbers two, three, and four in passengers airlifted were, in descending order, the L-1011 (79,730), DC-10 (43,131), and DC-8 (8,643).[17]

The airlines also contributed crews. MAC required each CRAF carrier to maintain at least a four-to-one crew ratio for each airplane committed to the program. However, Captain John Saux, Executive Vice President, Airline Pilots Association, admitted that airlines "had not kept track of the people current, qualified and available to fly CRAF, keeping in mind that the reserve and guard

TABLE III-5

CRAF LONG RANGE INTERNATIONAL (LRI) PASSENGER AIRCRAFT BY CARRIER

CARRIER	TOTAL LRI AIRCRAFT	COMMITTED STAGE I	% FLEET	COMMITTED STAGE II	% FLEET	COMMITTED STAGES I & II	% FLEET	COMMITTED STAGE III	% FLEET	COMMITTED STAGES I, II, III	% FLEET
American	131	2	2%	6	4%	8	6%	4	3%	12	9%
American Trans Air	10	1	10%	2	20%	3	30%	7	70%	10	100%
American West	4	0	0%	0	0%	0	0%	4	100%	4	100%
Continental	23	2	9%	4	17%	6	26%	17	74%	23	100%
Delta	69	0	0%	0	0%	0	0%	4	6%	4	6%
Federal Express	2	0	0%	0	0%	0	0%	1	50%	1	50%
Hawaiian	11	0	0%	0	0%	0	0%	11	100%	11	100%
Northwest	58	3	5%	11	19%	14	24%	38	66%	52	90%
Pan American	38	3	8%	7	18%	10	26%	27	71%	37	97%
Sun Country	1	0	0%	0	0%	0	0%	1	100%	1	100%
Tower	4	1	25%	0	0%	1	25%	3	75%	4	100%
Trans World	60	2	3%	10	17%	12	20%	17	28%	29	48%
United	131	4	3%	17	13%	21	16%	40	31%	61	47%
World	4	0	0%	1	25%	1	25%	2	50%	3	75%
TOTAL	546	*18	3%	58	11%	76	14%	176	32%	252	46%

* There were only 17 passenger aircraft in Stage I when activated 17 Aug 90. One Continental was added later.

SOURCE: Military Airlift Command, Plans and Programs, Readiness, Civil Air and Operability Plans (MAC/XPXO).

TABLE III-6

CRAF LONG RANGE INTERNATIONAL (LRI) CARGO AIRCRAFT BY CARRIER

CARRIER	TOTAL LRI AIRCRAFT	COMMITTED STAGE I	% FLEET	COMMITTED STAGE II	% FLEET	COMMITTED STAGES I & II	% FLEET	COMMITTED STAGE III	% FLEET	COMMITTED STAGES I, II, III	% FLEET
Air Transport International	5	1	20%	1	20%	2	40%	2	40%	4	80%
Arrow Air	10	1	10%	0	0%	1	10%	5	50%	6	60%
Buffalo Airways	4	0	0%	0	0%	0	0%	4	100%	4	100%
Connie Kalitta	12	1	8.5%	1	8.5%	2	17%	6	50%	8	67%
Emery/Rosenbalm	26	4	15%	3	12%	7	27%	15	58%	22	85%
Evergreen	11	2	18%	1	9%	3	27%	6	55%	9	82%
Federal Express	41	8	19%	6	15%	14	34%	27	66%	41	100%
Florida West	7	0	0%	0	0%	0	0%	4	57%	4	57%
Northwest	8	2	25%	1	13%	3	38%	5	62%	8	100%
Pan American	18	0	0%	0	0%	0	0%	18	100%	18	100%
Southern Air	6	1	17%	0	0%	1	17%	3	50%	4	67%
United Parcel	50	2	4%	2	4%	4	8%	9	18%	13	26%
World	9	1	11%	2	22%	3	33%	6	67%	9	100%
TOTAL	207	*23	11%	17	8%	40	19%	110	53%	150	72%

*There were 21 cargo aircraft in Stage I when activated 17 Aug 90.

SOURCE: Military Airlift Command, Plans and Programs, Readiness, Civil Air and Operability Plans (MAC/XPXO).

TABLE III-7

DESERT SHIELD/DESERT STORM AIRLIFT SUMMARY BY CIVIL AIR CARRIER TYPE

(As of 31 March 1991)

TYPE		AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
Boeing 707	Missions	12	16	12	21	47	2	42	4	156
	Short Tons	342	454	351	436	891	716	823	76	4,089
	Passengers	0	0	0	0	0	0	2	0	2
Boeing 727	Missions	0	0	1	5	9	32	56	33	136
	Short Tons	0	0	6	63	35	340	388	285	1,117
	Passengers	0	0	51	233	316	2,377	2,751	2,034	7,762
Boeing 747	Missions	76	147	128	99	224	160	299	323	1,456
	Short Tons	4,831	9,910	7,200	7,269	15,995	21,337	21,226	20,768	108,536
	Passengers	20,966	25,486	25,106	9,475	47,118	44,498	18,939	70,607	262,195
Boeing 757	Missions	0	0	0	0	0	0	0	2	2
	Short Tons	0	0	0	0	0	0	0	47	47
	Passengers	0	0	0	0	0	0	0	285	285
Boeing 767	Missions	0	0	0	0	0	0	0	19	19
	Short Tons	0	0	0	0	0	0	0	598	598
	Passengers	0	0	0	0	0	0	0	3,700	3,700
Lockheed	Missions	0	0	0	0	0	0	19	1	20
L-100	Short Tons	64	0	0	0	0	30	163	4	261
	Passengers	0	0	0	0	0	0	0	0	0
Lockheed	Missions	14	25	45	15	135	50	34	74	392
L-1011	Short Tons	399	801	1,373	472	5,940	2,477	1,248	2,229	14,939
	Passengers	2,347	4,597	8,995	2,292	28,029	13,353	5,673	14,444	79,730
Douglas	Missions	59	78	50	92	115	125	307	320	1,146
DC-8	Short Tons	1,730	1,986	1,134	1,951	2,592	6,013	7,773	6,117	29,296
	Passengers	428	1,145	627	1,059	613	1,421	990	2,360	8,643
Douglas	Missions	37	38	23	4	47	39	50	39	277
DC-10	Short Tons	1,584	1,830	663	146	1,975	2,588	1,982	1,519	12,287
	Passengers	8,818	6,082	5,000	116	9,050	8,225	1,342	4,498	43,131
TOTAL Missions		198	304	259	236	577	408	807	815	3,604
TOTAL Short Tons		8,950	14,981	10,727	10,337	27,428	33,501	33,603	31,643	171,170
TOTAL Passengers		32,559	37,310	39,779	13,175	85,126	69,874	29,697	97,928	405,448

SOURCE: Military Air Integrated Reporting System (MAIRS) Database, Military Airlift Command, Operations and Transportation, Command Center Reports (MAC/XOCR).

people would already be called back to active duty before CRAF was activated." This made it difficult to assess the airlines' true capability to support CRAF. He estimated that nearly half of his organization's 3,000 crew members were reservists called back to duty. To ensure they could meet all their requirements, the airlines stepped up recruiting and qualification training.[18]

Under CRAF agreements, airlines maintained overall responsibility for their crews and aircraft. Airlines set up round-the-clock control centers at their headquarters (Evergreen Airlines management called theirs the "War Room") to monitor commercial aircraft operating under military call signs. They communicated with Headquarters MAC and MAC's numbered Air Forces (NAFs) over secure telephones, which they were authorized under the CRAF program. Carriers operated through intermediate bases in Europe where they positioned relief crews and management and maintenance personnel. Commercial airlines' en route maintenance operations were manned continuously throughout the operation. Some airlines also stationed management and maintenance personnel at airfields in the Middle East.[19]

The usual routine was for crews to operate from Europe to the Middle East for two to three weeks, then return to the United States for domestic flying for the same period before returning to Europe for additional Desert Shield/Desert Storm duty. Because of the long distances flown, each chartered aircraft came with four crews. CRAF used the double crew method in which one crew rested while the other crew flew. Back-to-back missions with double crews became routine. Average monthly flight time for crews during the operation was about 100 hours. However, the Federal Aviation Administration (FAA) extended the monthly limit during the emergency to 150 hours of flight time.[20]

All volunteers, CRAF crews, like their military counterparts, carried hazardous cargo and faced possible Iraqi conventional, chemical, and biological weapons attacks. Consequently, MAC operations and intelligence specialists in Europe briefed the civilian crews on safety precautions, security issues, diversion plans, flight routes, and air traffic control procedures prior to each mission (although several airline executives complained that their crews did not receive such preparation until well into the deployment). MAC frequently changed civil aircraft routings to make it more difficult for the enemy to find and track them. Upon arrival in Saudi Arabia, the crews were again briefed on the latest security precautions and what to do if the base came under attack. Ordinarily, commercial crews did not remain overnight in Saudi Arabia. Turnaround time there was about two to three hours for commercial cargo aircraft. During Desert Shield/Desert Storm there were no commercial aircrew members killed or aircraft destroyed. Neither were any crew members hurt nor any aircraft damaged, according to William W. Hoover, Executive Vice President, Air Transport Association of America.[21]

The US air carriers' service went beyond that required by the CRAF arrangement. They waived restrictions on non-refundable tickets for troops volunteering and activated for service in Desert Shield/Desert Storm. The airlines also offered discount fares to family members traveling to visit troops in hospitals. On return trips, commercial passenger aircraft transported civilian evacuees, mostly women and children, back to the United States following their release from Baghdad, Iraq, and Kuwait City, Kuwait. Evergreen evacuated Asian refugees from Amman, Jordan, to Sir Lanka and Bombay, India, and Tower Airlines evacuated Americans from Israel on its scheduled operations between Tel Aviv and New York. Southern Air Transport, Evergreen, and other commercial carriers moved ammunition and other supplies into the Persian Gulf for coalition countries. Furthermore, several CRAF carriers took over MAC's Pacific and Atlantic channel missions (see "Mail, Gifts, and Channel Airlift," this chapter) to free C-5s and C-141s for Desert Shield/Desert Storm operations. When aircraft backed up at Dover AFB, Delaware, Federal Express used its trucks, some of which it had to modify, to move cargo from Dover to John F. Kennedy International Airport (IAP), New York, for airlift to the area of responsibility (AOR), which eased the pressure on Dover and expedited the lift.[22]

KC-10 Extender. Along with MAC's C-5 and C-141 aircraft and US commercial planes, SAC's KC-10A supertankers contributed to the Desert Shield/Desert Storm strategic airlift. Nicknamed the Extender, the KC-10 was a McDonnell-Douglas DC-10 modified for aerial refueling and cargo lift. It could transport 75 passengers and approximately 85 tons of cargo a distance of 4,400 miles. The KC-10's 8 1/2 feet high, 12 feet wide cargo loading door enabled the aircraft to carry most of a fighter squadron's support equipment and refuel the unit en route. The Extender's cargo compartment was fitted with powerful rollers and winches to expedite moving heavy loads. Combined, the aircraft's six tanks carried more than 356,000 pounds of fuel, almost twice as much as the KC-135 Stratotanker.[23]

USTRANSCOM and MAC believed that SAC during Desert Shield/Desert Storm did not use the KC-10 in the most efficient manner or as the Air Force intended. On 13 August, USTRANSCOM and MAC began querying SAC as to when it would make available KC-10s to carry cargo, but it was not until 24 August, as the number of fighter deployments slowed, that SAC finally agreed to release any: 5 immediately and 15 more "at some future date."[24] The five KC-10s increased MAC's airlift capability about 375 tons per day. By 10 September, up to ten KC-10s were airlifting cargo to the Gulf. Air Force Major General Vernon J. Kondra, MAC's Deputy Chief of Staff of Operations, recalled "we got up to finally a maximum of 20 at one time. And that was just prior to hostilities. Once hostilities began, we never got that many again until after the war ended. As a matter of fact, we had them [the full 20] for only about...two or three weeks....It was only because of General Johnson's insistence that we were able to get [any KC-10s] in the purely mobility role." The reason the "CINC [commander in chief] pushed very hard to get the KC-10s" was "to make a point." The aircraft, for the most

part, "were bought with mobility money...they were supposed to be mobility assets...allocated" to USTRANSCOM and MAC during war.[25] While serving in the common-user role for USTRANSCOM and MAC, KC-10s carried a total of 19,905 tons of cargo in support of Desert Shield/Desert Storm, mostly on channel missions.

USTRANSCOM's post-Desert Shield/Desert Storm analysis had serious ramifications for the KC-10's future. Army Lieutenant General James D. Starling, USTRANSCOM's Deputy Commander in Chief (DCINC), felt that based on his Desert Shield/Desert Storm experiences as United States Central Command's (USCENTCOM's) Director of Logistics and Security Assistance, planning assumptions for KC-10 strategic lift capability were overly optimistic, especially in the early critical phases of deployment. Under Air Force planning guidance, USTRANSCOM could count on 23 SAC KC-10s (40 percent of the 57 total) providing 2.54 million ton miles daily of strategic mobility capability in a major regional contingency. In reality, an average of only seven KC-10s operated in the pure cargo role from mid-August to the outbreak of war in the Persian Gulf in mid-January. To alleviate the problem and to provide more realistic planning figures, General Starling recommended to the Joint Staff that the Joint Strategic Capabilities Plan (JSCP) be revised to "apportion a specific fair share of KC-10s to the pure strategic cargo role" from the first crisis deployments through execution to the end of hostilities, and USTRANSCOM be a co-developer of mobility documents such as the JSCP: the command's expertise during the commander in chief's concept development "is essential to an executable plan."[26] General Johnson took his DCINC's argument the next logical step by telling his counterparts at the other unified commands that if they agreed the aircraft were mobility assets, then the KC-10s and the KC-10 mobility mission should be assigned to USTRANSCOM in peace and war.[27]

Navy C-9 Aircraft. Throughout Desert Shield/Desert Storm, USTRANSCOM devised innovative ways to augment the US airlift force. For example, during the operation the command integrated into the fleet Air Force Systems Command C-141s, Coast Guard C-130s, and Navy C-9s, which served in the common-user role for the first time. In late December 1990, four Naval Air Reserve squadrons, each with three aircraft and about 245 personnel, deployed from their home stations to Europe. Transport Squadron VR-55 from Naval Air Station (NAS) Alameda, California, and VR-57 from NAS North Island, California, operated from Sembach, Germany. VR-59, NAS Dallas, Texas, deployed to Bitburg, Germany, and VR-58, NAS Jacksonville, Florida, deployed to Naples, Italy. The German-based units received mission taskings from the Naval Air Logistics Office Detachment Alpha, which worked with MAC's 322d Airlift Division, Ramstein Air Base (AB), Germany. Those nine aircraft flew some of their missions in the common-user role. VR-58 took its orders from the Air Service Coordination Office, Mediterranean. Through the month of January, Navy C-9s primarily moved passengers to Saudi Arabia and Turkey. Later in the month, a rotating two-aircraft detachment from the German-based units began to

operate from Al Fujayrah, United Arab Emirates (UAE), while the remaining aircraft continued their operations from Germany and Italy.[28]

By February, the Navy C-9s shifted to a primarily resupply mission. The aircraft were reconfigured to handle eight pallets of cargo and began shuttling bombs and fuses to Moron, Spain, for B-52 bomber operations. As the war intensified, the Navy airlifters flew Eastern European routes in support of coalition forces in Turkey. During their Desert Shield/Desert Storm operations, from 1 January to 24 March 1991, the 12 Navy C-9s moved about 18,000 passengers and 3,750 tons on approximately 700 missions of which MAC estimated 209 were in the common-user role.[29]

Allied Support of US Airlift. Foreign flag air carriers provided another source of airlift during Desert Shield/Desert Storm. Securing gratuitous airlift and sealift from foreign governments for delivering and sustaining American forces was, in fact, a fundamental premise of US policy after Iraq invaded Kuwait. Friendly nations could provide their own or chartered aircraft and ships to DOD or they could make cash contributions to offset the cost of airlift and sealift.

Aircraft offered by commercial airlines, US and allied, in support of DOD passenger lift had to meet safety and other regulatory criteria. As a result of the crash of a State Department-chartered US DC-8 on 12 December 1985 that killed 248 members of the 101st Airborne Division, Congress in 1986 passed Public Law (PL) 99-661 requiring DOD to inspect all commercial aircraft chartered to carry US military personnel. The law also required carriers to have Federal Aviation Administration certification and 12 months commercial experience in the same types of services being chartered by DOD.* DOD promulgated the law and expanded upon its inspection and approval requirements through its Directive 4500.53. Additionally, the Fly America Act required all government-financed international cargo and passengers to move via US carriers if possible. The law applied even if foreign airlift was less expensive to the US government and more convenient to the traveler or shipper than US carrier service. The Fly America Act did not bar foreign flag airlift provided at no cost to the US government. As it turned out, under DOD policy issued on 31 August for Desert Storm, MAC was prohibited from contracting with foreign flag carriers. The policy permitted the use of free foreign cargo airlift services, but restricted US troops deploying to the area of responsibility to US military or DOD-approved US flag commercial airlines.[30]

Rather than activate CRAF Stage II and put additional hardship on the participating airlines during their busy and profitable summer vacation season,

*Defining "air carrier" as a "citizen of the United States," the statute technically did not apply to foreign carriers, but it would have been unfair to CRAF carriers to apply a more lenient standard to their foreign competitors.

General Johnson in mid-August sought approval from the Office of the Secretary of Defense (OSD) to solicit airlift from foreign carriers. The Republic of Korea's Korean Airlines (KAL), whose aircraft were already approved for CRAF cargo augmentation, was his first choice. With a fleet of 64 aircraft, 26 of which were internationally certified, the Asian ally could make a significant contribution to the deployment. The US Embassy in Seoul met with representatives of the Korean government on the 21st and two days later embassy officials told the State Department that Korea was amenable to making several B-747s available for cargo lift free of charge. The first Korean Airlines flight, also representing the first foreign flag airlift mission in support of the US deployment, departed El Toro Marine Corps Air Station, California, on the 28th and arrived in the AOR the following day. In September, the airline flew one mission per week from Tinker AFB, Oklahoma, to Dhahran, and in October, after South Korea pledged $18 million to fund additional cargo flights, the carrier began operating from Dover AFB to Dhahran, first one mission per week and later, starting in mid-November, two missions per week. When its crews refused to fly into the AOR when hostilities commenced on 16 January, KAL began flying from Dover to Frankfurt, Germany, twice a week. In addition, it flew three missions from Travis AFB, California, to Clark AB, Philippines.[31]

Kuwait's government in exile also offered to help. Four B-747s configured to carry passengers belonging to Kuwait Airways Corporation, the Kuwaiti national airlines, were at foreign airports when Iraq invaded the sheikdom on 2 August. Two of the jumbo jets were at Abu Dhabi IAP, United Arab Emirates, one was at London's Heathrow IAP, and a fourth was in Singapore. Kuwait offered up two of the aircraft free of charge to the United States, one at Abu Dhabi (the other 747 in the UAE was the Emir's private plane) and the one at Heathrow (the aircraft in Singapore, undergoing extended maintenance, was not a candidate).[32]

In August, prior to DOD's policy statement restricting transport of US troops to US military and commercial airlines, MAC went to great lengths to certify the two Kuwaiti B-747s to carry GIs. Command officials observed Kuwaiti aircrews on missions flown between Andrews AFB, Maryland, London, and Dhahran, and a survey team from the DOD's Air Carrier Survey and Analysis Office certified the two aircraft as in compliance with Federal Aviation Administration's structural integrity and safety regulations. The two planes arrived at Pope AFB, North Carolina, on the 27th, when FAA officials once more inspected them and performed in-flight checks of their crews. However, on 30 August OSD disapproved USTRANSCOM's request to use the Kuwaiti aircraft to transport US troops citing the possibility that, with American troops on board, they might become high-priority targets of Islamic terrorists loyal to Saddam Hussein.[33] According to General Kondra, the real reason OSD turned down the request was its distrust of the aircraft's Moslem crewmembers, in particular the Sudanese whose government favored Iraq.[34]

Both explanations seem plausible but incomplete, considering OSD's decree the following day prohibiting US troops from traveling on any foreign flag planes and banning contracting with foreign flag airlines for cargo lift. According to Air Force Colonel Victor J. Wald, who as a lieutenant colonel during Desert Shield/Desert Storm worked in OSD's Directorate of Transportation, OSD simply wanted the allies to donate lift. "Why pay for it, when you can get it free?" he asked rhetorically.[35]

The CRAF arrangement itself held part of the answer. CRAF was a partnership based on reciprocity. When US carriers committed to CRAF, the US government in return was committed to giving them DOD airlift business. "Frankly," in the words of Air Force Colonel Ronald N. Priddy, chief of MAC's Readiness, Civil Air, and Operability Plans Division, Plans and Programs Directorate, "at the time of this crisis, many US charter carriers did not want DOD to use foreign airlift in lieu of CRAF Stage II activation."[36]

The answer to "why the ban on passenger travel aboard foreign flags" was equally straightforward, according to Colonel Wald: OSD intended to adhere to the strict letter of the 1986 law. Inspections stipulated under the legislation were onerous, requiring US investigators to scrutinize airline safety and maintenance records. Not surprisingly, foreign businesses were extremely reluctant to divulge such information and, in the case of Kuwait, its national airline's records were in Iraqi hands. It was just easier for all parties to limit foreign flag airlines to carrying cargo and, as far as the United States was concerned, for free.[37]

Kuwait flew only one mission, carrying cargo on 4 September from Pope AFB to Dhahran, in support of the US Desert Shield/Desert Storm deployment.* MAC determined that the logistical effort required to reconfigure the passenger aircraft to lift cargo and the problems in loading cargo through the side door made further operation of the aircraft impractical. Consequently, MAC and USTRANSCOM decided not to use them in a weekly shuttle to the Persian Gulf as they had originally planned.[38]

Essentially dependent on the Gulf region for its oil, Japan obviously had a big stake in the region's future. The Japanese constitution, however, prohibited the Japanese government from committing the country's defensive forces to foreign military operations or from making direct payments to support combat operations. Nevertheless, many US leaders, media commentators, and citizens expected Japan to pay its fair share of Desert Shield/Desert Storm expenses.

*The nation's airlines flew several other missions to the AOR carrying explosives and equipment for Kuwaiti resistance fighters.

Finally, on 29 August, Prime Minister Kaifu stated publicly what Japan's contribution would be. He said his government would help transport non-lethal cargo in support of the operation. Consistent with his country's constitution, no weapons, ammunition, or soldiers would be carried on aircraft owned, operated, or chartered by Japan. Japan's government appropriated $80 million for airlift and attempted to enlist their national carrier, Japan Airlines, to fly the missions. JAL cockpit crews, however, refused to cooperate, apparently wanting nothing to do with the military support role. From late September to the outbreak of the air war on 16 January 1991, Japan paid for cargo missions flown from the continental United States (CONUS) to the AOR by Evergreen International, a CRAF airline. The first Evergreen 747 jumbo jet chartered by Japan departed Dover AFB on 22 September loaded with 28 pallets bound for Dhahran. On subsequent Japan-chartered missions, Evergreen used the Delaware base to move medical supplies, food, tents, and vehicle and aircraft parts to the Saudi base.[39] Sometimes, according to General Kondra, Evergreen stopped in Europe: "What [Japan] ended up doing was paying for the lift from the CONUS to Belgium, and from there MAC had to contract for the movement to the AOR. That way the Japanese didn't pay for 'war goods' that went directly to the AOR, only to Brussels."[40]

In mid-January, the Italian national carrier, Alitalia, offered free of charge one of its B-747s to fly airlift missions, but opted instead to lease a DC-8 from African International Airlines (AIA). Beginning 1 February, three times per week through March, the aircraft moved cargo from Frankfurt, Germany, to Dhahran. The Alitalia-charted AIA DC-8 was the only foreign flag aircraft in service to the United States that flew into the AOR during hostilities. Additionally, Luxembourg offered the United States en route service for C-141s and C-5s. USTRANSCOM and MAC declined because it was not needed.[41]

Considering the number of countries politically supporting US action in the Gulf, surprisingly few nations proved willing to fund or provide gratuitous airlift for the cause. In early October, the Joint Chiefs of Staff (JCS) asked the North Atlantic Treaty Organization (NATO) Council to designate the organization's Senior Civil Emergency Planning Committee (SCEPC) as the focal point for seeking civil airlift from NATO nations. With the airlift requirement increasing rapidly for the Phase II deployment, MAC in early November polled six of the largest NATO civil air carriers--Air France, British Airways, Royal Dutch Airline (KLM), Martin Air Holland, Lufthansa, and Scandinavian Airlines System (SAS)--about the possibility of obtaining their wide-body cargo aircraft for contract missions the following month. Noting that December holiday season was their highest volume, biggest profit month, the carriers were less than enthusiastic. Air France, Lufthansa, and Martin Air stated that they might have some aircraft available for charter by the new year.[42]

Colonel Priddy flew to Brussels, Belgium, on 15 November to ask SCEPC to help MAC obtain long-range aircraft from the European civil air carriers. The committee agreed to let the DOD Air Carrier Survey and Analysis Office teams begin the certification process. When the teams completed the full survey requirements under DOD directives in late November, they had certified long-range aircraft belonging to seven NATO countries to transport US troops on MAC charters, as shown in Table III-8.[43]

Higher headquarters approval was required before the contracts could be signed. Accordingly, USCINCTRANS sought OSD permission on 6 December, emphasizing that USTRANSCOM faced a severe airlift shortage through the end of January 1991. He noted that USTRANSCOM analysis showed passenger capacity to be short 1,500 seats in early January, while MAC's cargo requirements were already exceeding the airlift available by 300 tons daily. He also pointed out that the provisions of the Fly America Act had been met, the Air Carrier Survey and Analysis Office had performed the necessary inspections and reviews, and the carriers had met DOD contracting requirements. He stressed that the alternative to contracting foreign flags, activating CRAF Stage II, was unacceptable because the US industry could ill afford such disruption during the holidays.[44] On 11 December, the Secretary of Defense (SECDEF) granted General Johnson authority to contract with NATO foreign flag carriers, but he could do so only after he had exhausted CRAF Stage I, US volunteers, and free foreign lift. He had also to meet Public Law 99-661 provisions and directives. If US and NATO carriers could not meet the deployment requirement, SECDEF recommended CRAF Stage II activation.[45]

Following USCINCTRANS' orders, MAC moved to initiate the contracts. Initially, only Martin Air Holland and Nation Air Canada proved willing to contract at the MAC rates. Nation Air was a passenger carrier, and by the time contracts could be negotiated, the passenger airlift emergency was over. (Colonel Priddy blamed "a DOD contracting process that would stymie even the most aggressive marketing official" for the parties' inability to conclude a deal in a timely manner.) MAC offered business to Martin Air, but the airline declined to fly the routes the command specified (Norfolk-Sigonella-Bahrain or Tinker-Riyadh) because they transited and debarked in a war zone. After cessation of hostilities, Martin Air flew 16 charters from the US to Europe and the AOR paid for by Japan under similar contracts as those with Evergreen.) On the few occasions in December and January when the NATO carriers were willing to fly at MAC rates, CRAF aircraft were available to satisfy lift requirements.[46]

The commands also investigated the possibility of using Soviet AN-224 Condor aircraft to carry passengers and cargo, and on 25 January General Johnson requested Secretary of the Air Force Donald B. Rice's assistance in gaining the Soviet aircraft and crews.[47] Before the deal could be worked out, however, the

need for them diminished, which was all right with General Kondra who considered the aircraft "too much trouble." According to the MAC Director of Operations, the Condor

> couldn't haul passengers because it doesn't have an oxygen system. And it doesn't have any rails, so you can't put 463L pallets on board. It has no rollers. They use a system called "skate wheels" to move stuff in and out. Rolling stock...would have to be shored [to distribute the weight] because the floors are weak. The rear doors don't open, so you have to back everything in, so that you can drive it off at the destination. The aircraft doesn't forward-kneel [and] they literally have beams in the ceiling [of the cargo department] with cranes that run back and forth [suspending] a hook to pick up [cargo] crates. [A] very time consuming,...inefficient, [and] antiquated system, something like the one we used in the C-124s back in the [19]60s.[48]

TABLE III-8

NATO CIVIL AIR CARRIERS APPROVED FOR DEPARTMENT OF DEFENSE CONTRACT AIRLIFT

(December 1990)

CARRIER	LONG-RANGE AIRCRAFT
Air France (including Air Cargo)	B-747, A-310, A-320
British Airways (including Caledonian)	B-747, L-1011, DC-10, B-767, B-757, A-320
Canadian Airlines International	A-310, B-767, DC-10
KLM (Royal Dutch Airline)	B-747, DC-10
Lufthansa (including Condor)	B-747, A-310, DC-10
Martin Air (Holland)	B-747, DC-10, A-310, B-767
Scandinavian Airlines System (SAS)	B-767

SOURCE: Staff Summary (U), J. M. Ledden, MAC Assistant DCS Air Transportation, Foreign Air Carriers Surveys by the DOD Air Carrier Survey and Analysis Office, 17 Dec 90, as cited in MAC History, 1 Jan-31 Dec 90.

Although foreign flag carriers completed a relatively small number of the total commercial missions flown in support of the operation, the US government considered their effort to be symbolically important. The United States did not pay for foreign flag airlift during Desert Shield/Desert Storm. Four countries

flew 200 cargo airlift missions in support of US forces free of charge: Japan (124), South Korea (54), Italy (21), and Kuwait (1).[49] (See Table VII-5 and "Accounting," Chapter VII.) By war's end, no US troops had deployed on foreign flag airlines in support of the operation even though USTRANSCOM and MAC had the authority to do so provided they met applicable laws and directives.

Refugee Evacuation, Patriot Missile Deployment to Israel, and US Airlift Support for Allies. US airlift missions in support of American allies during Desert Shield/Desert Storm were many and varied.[50] They included 16 Puma helicopters from the United Kingdom to Saudi Arabia on four C-5s in October and November 1990; a chemical defense battalion (183 passengers and 63 vehicles) from Czechoslovakia to Saudi Arabia on thirteen C-5s in December; a Patriot missile battalion from the Netherlands to Turkey on one C-5 in January 1991; in February a Roland surface-to-air missile system from Germany to Turkey on ten C-5s; 100 passengers, two trucks, and two AMX-30 main battle tanks, specially equipped with anti-mine gear needed for breaching activities, from Paris to Saudi Arabia on two C-5s; and in March firefighting equipment from Texas to Kuwait. MAC also moved passengers, cargo, and equipment for Bangladesh, Argentina, Romania, and other coalition forces.[51]

Some of the command's highest visibility Desert Shield missions were humanitarian. When Iraq invaded Kuwait, several hundred thousand foreign nationals--from Egypt, India, Pakistan, Bangladesh, Sri Lanka, and the Philippines--worked in the two countries. Fearful of being caught in a large-scale war, most of them fled through southern Iraq and northern Saudi Arabia to safe haven in Jordan. Since Jordan lacked the resources to provide for the refugees, Jordan's King Hussein, who later gave vocal support to Saddam Hussein, asked the United States for assistance in repatriating them. As a result, the State Department, through DOD and USTRANSCOM, requested MAC airlift. In late September, one C-141 and two C-5s delivered 107 pallets of relief supplies from the United States and Pakistan to Shaheed Mawaffiq Assalti and King Abdulah Ben Al-Hussein ABs, Jordan. (They used the military fields instead of Amman to avoid the SA-7 missile threat in western Iraq.) The aircraft then airlifted three groups of roughly 140 refugees each to Colombo, Sri Lanka; Khaka, Bangladesh; and Manila, Philippines.[52]

For political as well as military reasons, the deployment of Patriot missiles to Israel stood out among all other US Desert Storm airlift operations in support of the allies. At 0030Z (Zulu or Greenwich time) on 18 January 1991, Iraq fired SCUD (surface-to-surface) missiles into Israel prompting President George Bush to assure Israeli Prime Minister Yitzhak Shamir that the United States would help defend Israel against further attacks. The United States feared that an Israeli military response would fracture the fragile Arab coalition against Iraq.

As a result, the Chairman, Joint Chiefs of Staff, at 0130Z the following day, ordered the Commander in Chief, US European Command (USCINCEUR), as the supported CINC and USCINCTRANS, as the supporting CINC, to deploy two Patriot fire units--personnel, launchers, missiles, and command, control, and communications gear--to Israel within 24 hours. The first Patriot unit had to be operational within 48 hours of the deployment order. Twenty-two missiles had to be delivered within 18 hours of the deployment order. Another 42 missiles had to be delivered within the next 30 hours.

At 0245Z on the 19th, USCINCTRANS directed MAC to deploy two Patriot batteries from Europe to Ben Gurion International Airport, Israel. In turn, General Kondra called Air Force Colonel Thomas R. Mikolajcik, the commander of MAC's 435th Tactical Airlift Wing, Rhein-Main AB, "at about 1800L Scott [AFB, Illinois] time--midnight in Germany. I got him out of bed," General Kondra recalled, "and said, 'Tom, go out on the ramp and find every last C-5 you can. If it's loaded, unload it. If it's broke, fix it. And stand by for [a] ram, because you're going to start having Patriot missions showing up'" and they must be operational in Tel Aviv "in less than 24 hours."[53]

Shortly thereafter, MAC diverted two Saudi Arabia-bound C-141s, one over Germany and the other over Egypt, each carrying eight Patriot missiles, to Ben Gurion. Between 1230Z and 1245Z those two aircraft and eight C-5s from Rhein-Main AB, Germany, carrying 8 Patriot launchers, arrived at Ben Gurion. About four hours later, two C-141s with 14 more missiles arrived at Ben Gurion from Ramstein. Therefore, 30 missiles, 8 more than were required, were in place within 15 1/2 hours, 2 1/2 hours ahead of schedule. At 2300Z on the 19th, USCINCEUR reported two Patriot missile batteries operational, 26 1/2 hours ahead of schedule.[54]

Meanwhile, loading of the remaining 42 missiles had already begun at Little Rock AFB, Arkansas, and Cape Canaveral, Florida. They arrived in Israel at 1855Z on the 20th, 6 1/2 hours ahead of schedule. The Iraqis launched their second SCUD attack on Israel on the evening of 22 January and the newly-arrived Patriots intercepted and destroyed the missile.[55]

The deployment was extraordinary. In just 21 1/2 hours after receiving their orders, US European Command (USEUCOM) and USTRANSCOM had delivered Patriot missiles to Israel and put them on alert outside Tel Aviv. In all, 9 C-141s and 30 C-5s had airlifted 544 passengers, 70 missiles, 8 launchers, and unit equipment totaling 2,776 tons from the United States and Germany to Israel in less than 42 hours. Most importantly, the airlift, the largest to Israel since the Yom Kippur War of 1973, kept Israel out of the war with Iraq. To help ensure the safety of innocent Israeli citizens and the continued military neutrality of their country, President Bush authorized the deployment of additional Patriot missiles to Israel. Over the next several weeks, MAC airlifted another 122

Patriot missiles and support equipment from Germany and the United States to Israel on 19 C-141 and 17 C-5 missions.[56] At the Secretary of State's request, several of the first aircraft into Tel Aviv evacuated American citizens to Germany on redeployment missions.[57]

Desert Express and European Desert Express. To help cope with "priority creep," the tendency for transportation users to continually elevate the priority of their air cargo, USTRANSCOM established Special Priority Code 9AU and an airlift system to support it. Named Desert Express, the operation was one of the command's most successful Desert Shield/Desert Storm initiatives. USTRANSCOM designed Desert Express to meet US Central Command's war-stopper requirements--such as spare parts for aircraft, tanks, and other high-tech equipment--and patterned it after commercial airlines' overnight delivery service. Oversize and outsize cargo,* including aircraft engines, were not authorized. Rarely did Desert Express carry passengers. (Defense Courier Service personnel were an exception.)[58]

Initiated by MAC on 30 October at USTRANSCOM's direction, Desert Express carried Army, Air Force, and eventually, Navy and Marine Corps cargo daily via a C-141 from Charleston AFB, South Carolina, to Dhahran and Riyadh, Saudi Arabia. Daily space allocations authorized each service were based upon the services' force structure and levels of operational activity in the AOR. USTRANSCOM adjusted the allocations periodically as missions and force composition changed. The aircraft departed from Charleston at 1230 Eastern Standard Time.

Cargo destined for the AOR had to arrive at Charleston no later than 1030 to make that day's express mission. The 1030 cutoff time dovetailed with the overnight mail and air express parcel delivery schedules in the United States and the flight schedules of CONUS airlift contracted by MAC for Air Force Logistics Command (LOGAIR) and the Navy (QUICKTRANS). MAC established a 75-minute turnaround time at Torrejon AB, Spain. To keep the ground time within that limit, no other aircraft were scheduled to depart the air base to the AOR within an hour of the time the Desert Express aircraft was scheduled to depart. A second crew and aircraft were kept on alert at the Spanish base in case the Desert Express mission ground aborted. Base personnel stood by to transfer cargo from the primary to a backup C-141 within 15 minutes if there was a ground abort. Including the stop for fuel and a crew change in Torrejon, it took a Desert Express mission about 17 hours to reach the AOR. When the C-141 landed, ground crews unloaded the Desert Express cargo, sorted it by destination, and loaded it on C-130 shuttles. Overall, Desert Express reduced response time for the highest priority shipments from as much as two weeks to as little as 72 hours. According to Army Major General Donald R. Williamson, Commanding

*For a definition of "outsize" and "oversize" cargo, see "Civil Reserve Air Fleet," this chapter.

General, Army Aviation Systems Command, Army aviation by mid-February had "reached historic readiness rates," thanks largely to Desert Express.[59]

The operation's success spawned a similar arrangement in Germany between Rhein-Main AB and the Persian Gulf. Called European Desert Express, this shuttle began on 8 December 1990. When Desert Express and European Desert Express capability exceeded 9AU requirements, the flights also carried Desert Shield/Desert Storm priority cargo (coded 9BU).[60] To help move a backlog of 9AU cargo, USTRANSCOM on 13 February 1991 began flying a second C-141 mission per day from Charleston. It departed at 1400 Eastern Standard Time, 1 1/2 hours after the first, staged through Torrejon, and stopped at King Khalid Military City (KKMC) and Dhahran, Saudi Arabia.[61] USTRANSCOM discontinued the second Desert Express mission on 14 March 1991.[62]

Desert Express and European Desert Express statistics are located in three tables. Table III-9 breaks down by service and by month the total 9AU tonnage carried by the two express delivery systems. Table III-10 depicts monthly totals of 9BU cargo and Table III-1 shows missions. By the end of the war, Desert Express had moved nearly 2,040 tons of 9AU cargo and about 27 tons of 9BU cargo on 135 missions. (Desert Express continued through 20 May carrying an additional 512 tons of 9AU cargo.) At the end of its operation on 14 March 1991, European Desert Express had airlifted 680 tons of 9AU cargo and 761 tons of 9BU cargo on 92 missions. Interestingly, even Desert Express faced "priority creep." On 11 January, for instance, Charleston received, as 9AU-coded cargo, a pallet of duplicating paper, six pallets of truck tires, and one pallet of sandbags.[63]

Mail, Gifts, and Channel Airlift. Channel operations, established logistics routes between major installations with a known expectation of cargo and passenger transportation requirements, primarily supported sustainment rather than unit cargo moves. During Desert Shield/Desert Storm, channel missions--military and commercial--flew from Tinker AFB, Oklahoma, and Dover AFB, Delaware, to Cairo, Egypt; and Dhahran, Riyadh, Al Jubayl, and King Khalid Military City, Saudi Arabia. From Norfolk, Virginia, strategic airlift channel missions flew to Sigonella, Italy; King Faisal, Saudi Arabia; and Bahrain. Also from the East Coast, MAC channels ran from McGuire AFB, New Jersey, to Dhahran and Riyadh. On the West Coast, MAC operated a channel from Travis AFB, California, to Clark AB, Philippines; Diego Garcia in the Indian Ocean; Cubi Point, Philippines; Masirah, Oman; and Al Fujayrah, United Arab Emirates. A channel connected Clark to Diego Garcia and Dhahran, and in Europe a channel tied Sigonella to King Faisal. As requirements changed during the operations, so did channel mission frequency and airports of embarkation and debarkation.[64] Of special note, MAC established "air-bridges" to move nearly 300 tons of M-117 munitions (45 C-141-or 15 C-5 equivalent loads) from the United States and Europe to the AOR in January 1991 for the air offensive against Iraq.[65]

TABLE III-9

DESERT EXPRESS/EUROPEAN DESERT EXPRESS: 9AU
(WAR-STOPPER REQUIREMENTS CARGO)
(CARGO IN SHORT TONS)
(As of 10 March 1991)

DESERT EXPRESS*

	ARMY	AIR FORCE	NAVY	MARINES	TOTAL
Aug 90	--	--	--	--	--
Sep 90	--	--	--	--	--
Oct 90	2.17	.27	--	--	2.44
Nov 90	171.45	52.53	1.49	9.31	234.78
Dec 90	229.31	124.62	26.32	17.07	397.32
Jan 91	266.24	251.42	36.01	20.34	574.01
Feb 91	274.58	273.74	39.49	40.88	628.69
Mar 91 (1-10 Mar)	123.14	66.47	6.17	5.86	201.64
TOTAL	1,066.89	769.05	109.48	93.46	2,038.88

EUROPEAN DESERT EXPRESS*

	ARMY	AIR FORCE	NAVY	MARINES	TOTAL
Aug 90	--	--	--	--	--
Sep 90	--	--	--	--	--
Oct 90	--	--	--	--	--
Nov 90	--	--	--	--	--
Dec 90	19.58	61.55	--	--	81.13
Jan 91	110.42	184.72	--	--	295.14
Feb 91	91.17	168.76	--	--	259.93
Mar 91 (1-10 Mar)	17.53	25.76	--	--	43.29
TOTAL	238.70	440.79	--	--	679.49

* Desert Express (Start date 30 Oct 90; Discontinued 20 May 91)
** European Desert Express (Start date 8 Dec 90; Discontinued 14 Mar 91)

SOURCE: US Transportation Command/Crisis Action Team Desert Express/European Desert Express Daily Activity Report.

TABLE III-10

DESERT EXPRESS/EUROPEAN DESERT EXPRESS: 9BU
(DESERT SHIELD/DESERT STORM AIRLIFT CARGO)
(CARGO IN SHORT TONS)
(As of 10 March 1991)

	DESERT EXPRESS*	EUROPEAN DESERT EXPRESS**
October 1990	***	--
November 1990	***	--
December 1990 (19-31)	1.31	293.94
January 1991	6.10	193.00
February 1991	8.31	182.08
March 1991 (1-10 Mar)	10.93	92.44
TOTAL	26.65	761.46

* Desert Express (Start date 30 Oct 90; Discontinued 20 May 91)
** European Desert Express (Start date 8 Dec 90; Discontinued 10 Mar 91)
*** No continental United States data before 19 Dec 90 available.

SOURCE: US Transportation Command/Crisis Action Team Desert Express/European Desert Express Daily Activity Report.

The number of channel missions to the AOR increased dramatically, from less than 10 in August to nearly 900 in November, or about 30 per day. According to General Kondra, except for Presidential and Vice Presidential support, air evacuation, and MAC's Prime Nuclear Airlift Force Mission, "there wasn't a whole lot of [channel] activity outside of Desert Shield/Desert Storm. Users realized they were not going to get [air]lift so they didn't put stuff into the [aerial] ports [of embarkation]. They sent it by surface transportation."[66] By February, the US strategic airlift force was flying 45 channel missions per day to the AOR. Overall, airlift moved just under 25 percent of all sustainment cargo (see Table II-1), 2 1/2 times more than anticipated. Mail was primarily responsible for the unexpectedly large requirement.

Following General Johnson's address to the World Affairs Council in Boston in late November 1990, someone in the audience asked him to name the "most precious resupply item" MAC was airlifting to the Arabian peninsula. USCINCTRANS replied, without hesitation, "US mail...we're hauling 150 to 175 tons a day."[67] From 7 August to the end of November 1990, MAC airlifted more than 150,000 tons of mail to the AOR. This equated to one pound of mail per week for every man and woman deployed up to that time. Unlike recent US

operations in Grenada and Panama, the supported CINC did not impose a mail embargo during Desert Shield/Desert Storm,[68] although some USTRANSCOM and MAC senior officers would have liked to institute one early in the new year so the precious airlift resources allocated to mail could be used instead in direct support of the coming offensive.[69] Army General H. Norman Schwarzkopf encouraged all forms of public appreciation for the deployed troops and that meant mail delivery with as few restrictions as possible.[70]

It also meant tons of packages for movement to the AOR. The DOD actively solicited public donations of items not readily available intheater. Individuals, organizations, institutions, and corporations donated to the government or sent to the troops a wide variety of items, including cookies, chips, soft drinks, exercise equipment, cards, games, sunblock, and toiletries. Initially, there was tremendous confusion in DOD as to what to do with these goods: no agency was in charge. In late September, as both the worth and the bulk of gifts reached huge amounts, USCENTCOM designated the Defense Logistics Agency (DLA) as the central clearinghouse for gifts. DLA established a "Donation Hotline" to coordinate receipt of gifts, provided current information on what items the troops most desired, and made known to donors what items were prohibited: alcoholic beverages, pork products, anti-Islamic literature, and nude and semi-nude photographs. DLA also established collection points, provided packing and shipping materials, grouped items by consumable, non-consumable, and destination (about 24 percent of packages and mail were labeled to "Any Service Member," which greatly complicated the sorting process), and arranged transportation with USTRANSCOM's Crisis Action Team, which made every effort to send consumables via air and non-consumables via sea. In late November, USCENTCOM dubbed the airlift and distribution of gifts to the troops "Operation Santa."[71]

The mail operation, nicknamed "Desert Mail," required USTRANSCOM and MAC to work closely with the Military Postal Service Agency (MPSA) and the US Postal Service (USPS) to develop and refine mail delivery procedures. Public Law (Title 39) prohibited military aircraft from transporting mail if either US or non-US flag commercial carriers were available for the mission. Consequently, early in the operation, MAC-contracted commercial carriers airlifted mail from US major commercial air postal gateways at JFK International Airport (IAP), New York; O'Hare IAP, Chicago; and Washington-Dulles IAP, Virginia, to London's Heathrow IAP. From there, the Saudi government used Saudi Royal Airlines daily to move mail forward to Dhahran, Jeddah, and Riyadh. The Saudi national airlines occasionally airlifted mail from JFK IAP to the area of operations.[72]

In mid-September the volume of mail requiring airlift rose dramatically (up to approximately 85 tons per day), due in large part to USPS' removal, at General Schwarzkopf's request, of the 12-ounce weight restriction on first class letters

and parcels addressed to Desert Shield Army Postal Offices (APOs) and the Navy's Fleet Postal Offices (FPOs). Mail requirements intheater also began to increase following the President's authorization on 20 September of free postage for deployed troops writing home. To help reduce mail backlogs at JFK and Dulles, the MPSA, in consultation with MAC, had its trucks move mail from the east coast gateways to Dover AFB, Delaware, for airlift via military and commercial aircraft. Army postal unit and Air Force mobile port squadron reservists helped Dover's aerial port squadron personnel prepare the loads for delivery.[73]

By late October, Dover could not cope with the huge volume of mail and the large quantity of unit equipment and sustainment cargo sent its way. (See "Airlift Sustainment Cargo Backlog," this chapter.) In anticipation of even larger mail airlift requirements in the coming holiday season, MAC once again restructured its airlift mail system by making McGuire AFB the major east coast mail departure point. As a result, USPS began trucking mail from JFK and Dulles to the New Jersey base. (The Army Reserve postal unit at Dover moved to McGuire.) On 24 October, the command began flying three C-141s daily from McGuire solely in support of Desert Mail. At the end of November, the command added two more missions using DC-8s. (To the maximum extent possible, MAC used DC-8s to carry the mail. In its cargo mode, the aircraft was not large enough to haul heavy equipment, but it was ideally configured to carry a large number of uniformly-sized pallets.) The flights made an en route stop at either Rhein-Main AB, Germany or Zaragoza or Torrejon ABs, Spain, before flying to either Riyadh or Dhahran.[74]

In mid-November, the command established two other continental US aerial ports for processing Desert Shield mail: Tinker AFB, Oklahoma, and Naval Air Station Norfolk, Virginia. Tinker served as the major aerial port of embarkation (APOE) for mail routed by APO zip code to the postal gateways of O'Hare, San Francisco, and Dallas. USPS trucks moved the mail from those international airports to the Oklahoma base where it was put on pallets for movement to the AOR on Desert Mail-dedicated channel missions, three C-5s and one DC-8 daily to Dhahran and two DC-8s weekly to Riyadh. By the first week of January, Tinker was receiving from 30 to 50 tons of mail every day, with parcels constituting the bulk of the tonnage. MAC used as many military and commercial aircraft as needed daily to keep the mail from backing up. Norfolk supported the airlift of mail to Bahrain, the US Navy's major resupply station in the AOR. Not large enough in volume to justify a dedicated lift, between 13 and 50 tons daily through December, the mail at Norfolk moved to the Gulf with other Desert Shield/Desert Storm sustainment cargo. Additionally, the command in late November dedicated two C-141s to carry Europe-originated mail daily from Rhein-Main to the AOR. The European edition of the *Stars and Stripes* reached the troops in this manner. In early 1991, as the prospects of war

appeared ever more likely, C-141s in Europe were moving between 10 and 30 tons of mail daily to Dhahran and Riyadh.[75]

The effort in the States was gargantuan. Assistant Postmaster General Allen Kane estimated that in the CONUS "volumes [of mail--letters and packages] in November and December dramatically increased to a Christmas peak of nearly 530,000 pounds per day."[76] During the first week of January 1991, McGuire was receiving 100 tons of letter mail daily,[77] and Diane K. Morales, Deputy Assistant Secretary of Defense (Logistics), Office of the Assistant Secretary of Defense (Production and Logistics), estimated that as of 14 February MAC had airlifted to the AOR 30,000 tons of mail.[78] By the end of Desert Storm, MAC military aircraft had carried the majority of mail to the troops.[79]

Although MAC moved the mail from the United States to the AOR in two days--an amount of time considered acceptable by USCENTCOM, the services, and other USTRANSCOM customers--the overall delivery time did not meet expectations. Mail took between 11 and 23 days on average from postmark in the United States to receipt by troops in the AOR: 7-11 days with USPS; 2 days with MAC; 2-6 days intheater. The USPS goal was 7-13 days postmark to receipt: 3-5 days with USPS; 2 days with MAC; and 2-6 days intheater.[80]

Several DOD and USPS initiatives helped speed the flow of mail to the troops. Air transportation specialists at MAC's Twenty-First Air Force, McGuire AFB, convinced MPSA of the need to use tri-wall reusable cardboard containers--each holding between 500 and 600 pounds of mail--to move the bags to McGuire, Tinker, and Norfolk, and as a result, the agency purchased thousands of them in November for the operation at a cost of over $500,000. Before the advent of the containers, aerial porters strapped the mail bags to the pallets, an extremely cumbersome and manpower intensive process. By most accounts, containerization of mail was a big success.* Consolidating mail bags in containers sorted by destination and fastening eight of them to a 463L pallet in the United States greatly expedited the operation at both ends.[81]

In another initiative, MPSA in November required major postal gateways to begin sorting mail according to a new system of APO zip codes for each Middle East aerial port of debarkation (APOD) before the mail bags were trucked to McGuire, Tinker, and Norfolk. MPSA furnished guidance to the USPS on how to sort the mail by an APOD/APO matrix so that the MAC military and commercial aircraft could route more mail pallets to their final destinations, rather than sending the mail first to the major APODs at Dhahran and Riyadh for transshipment to other locations in the Gulf.[82] Furthermore, all parties--USTRANSCOM, MAC, MPSA, USPS, and theater postal managers--believed

*The containers required forklifts, so units intheater without such equipment continued to receive 70-pound bags tied to pallets, the old fashioned way.

their frequent conference calls were a tremendous help in identifying and fixing mail processing and delivery problems as were joint USPS/DOD teams, which monitored mail transit times from postmark date through major USPS mail processing centers to domestic military facilities. They also agreed that they needed to have contingency plans for mail delivery, which were not available for Desert Shield. USPS, one of the few civil agencies that came close to reaching the limit of its ability to support DOD needs during Desert Shield/Desert Storm, believed that for it to be prepared for the next war it needed to be much more involved in DOD exercises and planning activities.[83] To speed mail delivery, USTRANSCOM asked USPS to consider establishing a "contingency command post" as a single-point-of-contact for up-to-date postal information. The service should also enforce use of nine-digit zip codes and limit theater mail consolidation points to "two or three 'super' APOs [Army Post Offices]."[84] Finally, USTRANSCOM wanted mail lift requirements integrated into deliberate planning. Specifically, the command wanted most of the package mail to move by sea in future contingencies.[85]

Aeromedical Airlift, Planning, and Regulating. USTRANSCOM and MAC planned and carried out aeromedical airlift in support of Desert Shield/Desert Storm.[86] During the operation, C-9 Nightingales were augmented by C-141s, which flew aeromedical evacuation (AE) missions between theaters, and by C-130s, which carried patients within the USCENTCOM AOR. During the operation, the entire airlift force--active duty, reserve, strategic, and tactical--transported nearly 16,400 patients in the AOR, from the AOR to Europe, and from Europe to the United States (see Table III-11).[87*] Additionally, the commands intended to use, as part of the CRAF Stage III, Boeing 767 aircraft specially equipped with stanchions, electrical conversion pallets, and liquid oxygen kits.[88**]

The commands were deeply involved in the medical planning process. To support patient reception in the continental United States (CONUS), USTRANSCOM and MAC developed the AE appendix to Forces Command's Integrated CONUS Medical Mobilization Plan (ICMMP).[89] Plans for transportation of casualties from State-side reception points included the use of CONUS-dedicated C-9s, Army rotary wing aircraft,[90] and Air Force and US Coast Guard C-130s.[91] Air Force Reserve C-130 units would augment aeromedical assets in Europe,[92] and in its AOR, USCENTCOM would expand surface and afloat medical transport operations[93] and supplement MAC AE forces with Advance Trauma Life Support trained flight surgeons.[94] USTRANSCOM planned to ship blood to the Persian Gulf via a

*Related to but outside of the AE system, MAC moved human remains via air from the AOR to the mortuary at Dover AFB, Delaware. See Endnote 86, this chapter.

**The equipment had been engineered but not procured just prior to Desert Shield. The escalating crisis prompted General Johnson to expedite the project to outfit ten Boeing 767s.

C-141 out of McGuire AFB, New Jersey, home to the Armed Force Whole Blood Processing Laboratory.[95]

TABLE III-11

DESERT SHIELD/DESERT STORM AEROMEDICAL EVACUATION* PATIENTS TRANSPORTED

(As of 10 March 1991)

	PERSIAN GULF		PERSIAN GULF TO EUROPE		EUROPE TO CONUS	
	LITTER	AMBULATORY	LITTER	AMBULATORY	LITTER	AMBULATORY
Aug 90	----	--	--	--	--	
Sep 90	92	247	181	346	89	291
Oct 90	99	310	214	400	77	262
Nov 90	86	303	277	395	170	485
Dec 90	129	377	304	503	154	484
Jan 91	270	550	414	818	483	1,180
Feb 91	324	410	725	890	446	846
Mar 91	600	227	567	507	336	476
TOTAL	1,600	2,424	2,682	3,859	1,755	4,024

Total Patients (litter and ambulatory): 16,344

*Includes patients carried on active duty, reserve component, strategic, and tactical aircraft.

SOURCE: US Transportation Command Situation Reports (SITREPs).

Projected casualty numbers caused extreme concern among AE planners, according to Air Force Colonel Carroll R. Bloomquist who served with the Command Surgeon Cell of the USTRANSCOM Crisis Action Team. For instance, the Center for Disease Information, a Washington, D.C.-based research organization, estimated 10,000 dead and 35,000 wounded in a three-month conflict. At that rate, USTRANSCOM and MAC would have been required to dedicate C-141s to the AE role, i.e., pull them from the cargo flow;[96] use commercial aircraft for ambulatory patients; and activate CRAF Stage III to employ Boeing 767s in the AE role. Fortunately there was not a major ground war with large numbers of wounded requiring aeromedical evacuation. Even so, aeromedical airlift specialists learned a great deal from Desert Shield/Desert Storm. The deployment reinforced their belief that they needed access to Boeing 767s in CRAF Stage II for AE operations. Additionally, they concluded that medical personnel at the unified commands needed to become more deeply involved in the Time Phased Force Deployment Data (TPFDD) refinement process. Furthermore, the commands determined that the patient evacuation and care process was fragmented, which resulted in aeromedical airlift aircraft not being used to their optimum capability. Medical regulating--identifying a destination hospital with the proper level of care and an available bed--and assignment of the aeromedical evacuation mission to actually move the patient were two separate processes. Moreover, medical regulating was fragmented into two different systems: USEUCOM's peacetime system and the USCENTCOM's wartime system, each of which used different methods of reporting data. As a

result, patients arrived at hospitals unexpectedly and in groups too large to accommodate efficiently. Other times, hospitals did not receive the level of casualties they had been led to expect and, consequently, they reduced capability prematurely. Thus fragmented regulating, at times, meant no regulating.[97]

Another consequence of fragmentation was lack of patient intransit visibility (see "Intransit Visibility," Chapter II). The peacetime medical regulating systems tracked patients by name while their wartime counterparts categorized patients by most important injury. The results were delays and backlogs at aerial ports of embarkation and considerable anxiety among patients' supervisors and loved ones. Navy Commander Gary C. Breeden, who commanded a forward-deployed hospital during the war, used what he called the "wifeline" to compensate for the inadequacy. He arranged for patients to call their spouses each time they stopped en route. The spouses would call Commander Breeden's wife in the United States, who in turn would call Commander Breeden in the theater of operations. Commander Breeden would then call patients' commanders with status reports.[98] At the war's end, USTRANSCOM recommended that the Joint Staff establish a single, joint, peacetime and wartime process that integrated medical regulating and aeromedical airlift. To do so, a single unified command would need to be the process owner. USTRANSCOM also emphasized that the joint community needed a single, joint, peacetime and wartime command and control system for intransit visibility. According to the command, the process owner should be USTRANSCOM and the system should be USTRANSCOM's Global Transportation Network (GTN).[99]

Tactical Airlift. While US flag and allied commercial aircraft augmented strategic or "intertheater" airlift, C-130s provided the tactical or "intratheater" airlift for Desert Shield/Desert Storm. Nicknamed "Hercules," the four-prop, Lockheed-built C-130 could take off and land on as little as 2,000 feet of dirt runway. With a maximum takeoff weight of 155,000 pounds, it could carry 92 combat troops, 74 litter patients, or 42,000 pounds of cargo. Its expertise: dropping troops and equipment into hostile areas using a variety of parachute delivery techniques. Although USTRANSCOM assets, C-130s operated under the direct control of the theater commander, General Schwarzkopf. Eventually numbering 149 aircraft (including five from South Korea), C-130s completed nearly 13,900 missions carrying about 242,000 passengers and 174,000 tons of cargo in support of the theater commander.[100]

MAC's senior officer in the USCENTCOM AOR was the Commander, Airlift Forces (COMALF). He was responsible for managing theater-assigned airlift forces and, in general, coordinating airlift activities intheater as a member of the USCENTCOM Air Force component's (CENTAF's) staff. The first COMALF was Air Force Brigadier General Frederic N. Buckingham, Vice Commander of MAC's Twenty-First Air Force. In mid-October, Air Force Brigadier General Edwin E. Tenoso, Vice Commander of MAC's Twenty-Second Air Force,

became COMALF replacing General Buckingham, who returned to his position at the Twenty-First.[101]

The tactical airlift force intheater performed a wide variety of missions. There were two types of scheduled missions: Star missions transported people and Camel missions, for the most part, hauled cargo. At their peak, Star and Camel missions numbered 25 each per day. Some of the first C-130s on the scene moved ammunition, tents, fuel, and other supplies from prepositioned stocks at Thumrait, Masirah, and Seeb, Oman, to establish logistical bases for arriving air and ground forces. In mid-January, C-130s on 1,175 missions carried nearly 14,000 passengers and 10,000 tons of cargo for the XVIII Airborne Corps from King Fahd to Rafha in northern Saudi Arabia near the Iraq border in support of the "Hail Mary" maneuver. Soon thereafter, the aircraft shifted part of the Marine Corps forces to the northwest so they could penetrate Kuwait at the geographic "bend in the elbow." They also dropped 15,000-pound BLU-82 bombs (nicknamed "Big Blue 82s" and "daisy cutters") on Iraqi fortifications and airdropped food and water to Iraqi prisoners of war.[102]

ASSESSMENT

Military Airlift Command Fleet. USTRANSCOM learned much about airlift from its Desert Shield/Desert Storm experiences. When operating in the desert, C-130 crews learned to wipe down wheel struts after every flight to keep sand and other grit from working into hydraulic seals. Cleaning cockpits daily to prevent sand and dust from sifting into the electronics and regularly flushing water through engines to prevent corrosion were also essential in the desert. General Tenoso felt it would have been better to deploy whole C-130 wings rather than form provisional wings out of squadrons from several stateside units.[103]

General Tenoso also recommended changes to the C-130 training program based on his Desert Shield/Desert Storm experiences. Units should do more "integration training." Crews needed more experience operating with fighters, airlifters from other units, and command, control, and communications aircraft. He wanted MAC to put more emphasis on flying without the use of communications and navigation equipment. Crews needed to practice high-altitude airdrops. Finally, he recommended that, for wartime tempo operations such as he experienced in Saudi Arabia, MAC needed to raise the C-130 crew ratio from 1.5 to 2.0. He wanted C-130s upgraded with satellite and other communications gear. Inertial navigation equipment was also a high priority. In general, he felt C-130 crew training and aircraft equipment needed to be more oriented toward war.[104]

The command pushed its C-141 and C-5 aircraft to the limit during Desert Shield/Desert Storm. From December 1990 through January 1991, C-5s flew nearly 3 1/2 times their usual peacetime rate. (See Table II-1.) During this

period the C-5 fleet was nearly 100 percent committed to the deployment to the Persian Gulf. By mid August, 195 of MAC's 266 C-141s were supporting Desert Shield. Of the remaining Starlifters, 23 were committed to other high-priority missions. Another 48 were in various stages of maintenance, including 18 grounded for wing cracks. For the first time in history, the nation's entire strategic airlift capability was committed worldwide.[105]

The normal peacetime C-141 mission rate was about 500 missions per month. In August C-141s completed 1,041 missions and by December they were flying over 1,400 missions per month, a pace that continued through February. MAC estimated that the tempo of operations during that seven months equaled one year of programmed service life. Increasing reports of cracks around windshields and in wings and wing joints highlighted the command's concerns.[106]

Strategic airlift aircraft reliability records during the deployment reflected the wartime workload. On average, C-5 and C-141 missions were delayed 10.5 hours with logistics problems predominating and, on average, one third (at times it was as high as 50 percent) of the C-5 fleet was classified as unavailable. Of that third, 18 percent were down due to maintenance problems. Furthermore, of the C-5s available to fly missions on any given day the average delay per mission because of logistical problems was nine hours. The C-141 had a better maintenance record with between 8 percent and 11 percent of the fleet unavailable due to maintenance. Overall, the C-141 had an 84 percent availability rate and averaged a 4.3 hour mission delay because of logistics. Maintenance and other problems--late call-up of reservists (see "Total Force Integration," Chapter VII), rapidly changing requirements (see "Deliberate and Execution Planning," Chapter II), problems with cargo loading and unloading (see "Airlift Sustainment Backlog," this chapter), and "inefficiencies due to operational needs," such as the need to maintain unit integrity--contributed to lower than expected utilization rates, which were from a third to a half below planning factors. The C-5 averaged 5.7 hours per day compared to the planning factors of 11 for surge and 9 for sustained operations. The C-141 averaged 7.0 hours versus the cited values of 12.5 and 10.[107]

Planning factors themselves were overly optimistic for the C-141 (the C-5 had no demonstrable baseline because it had never been used in a sustained wartime operation). For example, MAC knew that there was a problem with the wing joint of the C-141 prior to Desert Shield/Desert Storm but the command did not revise the planning factors to reflect reality. Plans called for a wartime payload of about 25.6 tons over 3,500 miles. During Desert Shield/Desert Storm, the C-141 averaged only 19 tons, 26 percent lower than planned. Although several factors helped to explain the shortfall--bad weather, desire to maintain unit integrity, and aircraft fatigue--fuel requirements were the primary cause.* MAC

*RAND concluded that aircraft fatigue was the primary cause. Safety concerns over the wing cracks prompted MAC on 8 August 1990 to limit C-141s to 22.5 tons. Those departing Charleston AFB could

operations planners, contrary to deliberate planning assumptions, had adopted approximately 20 tons as the standard Allowable Cabin Load (ACL) in JCS exercise deployments prior to Desert Shield/Desert Storm. Their experience showed that using the higher ACL (25.6) merely resulted in tons of "frustrated cargo" as crews required more fuel or the aircraft "cubed out."[108]

Like the overworked aircraft, overtaxed aircrews limited throughput and heightened safety concerns. For safety reasons, the Air Force limited airlift aircrews in peacetime operations to 16 hours per day, 125 hours each 30-day period, and 330 hours each 90-day period. Early in the Desert Shield deployment, MAC raised the limits to 18, 150, and 400, respectively.[109]

MAC's original concept of operations for Desert Shield fit the 18, 150, and 400 hour parameters. A crew would pick up an aircraft in the United States, fly it to an onload base, then continue to an en route base in Europe. That leg would last 12 to 15 hours including air and ground time. There the crew would sleep and a fresh crew would pick up the refueled aircraft and fly it to Saudi Arabia for offloading. MAC figured that a typical mission from Europe to the theater would take about ten hours, seven in the air plus three for pre-mission planning and post-mission duties. Next, the crew would fly the aircraft to a stage base in the region for rest and relaxation. A third crew at the stage base, having had a night's sleep, would return the aircraft to Europe, where a fourth crew would fly it back to the United States. Each crew would thus use up 10 to 15 hours of its monthly duty limit while remaining within the daily limit of 18 hours. Theoretically, then, crews could have flown missions every day or two and remained within the monthly and quarterly limits.[110]

Unfortunately, MAC could not put into practice this crew rotation system. Fearing that the intheater airfields, already saturated with fighter, bomber, and tanker aircraft and crews, could not accommodate large airlift aircraft and crews, United States Central Command (USCENTCOM) denied MAC access to a stage base intheater.* Without a stage base for crew rest, MAC was forced to use three pilots instead of two per aircraft for the 20 to 24 hour crew day--crews were spending more time on the ground intheater than planned--for the Europe-Saudi-Europe flight. With an augmented crew, the crew duty day increased to 24

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carry no more than 20 tons because of the greater distance from there to Europe compared to the other MAC east coast bases. In November MAC instituted a 20-ton limit for the entire fleet to simplify the planning and loading process. See Lund, John, et al., *An Assessment of Strategic Airlift Operational Efficiency*, May 1992. However, for MAC the Allowable Cabin Load (ACL) determining factor is that which results in the *lowest* number. In Desert Shield/Desert Storm, that was fuel. (SOURCE: Intvw (U), Dr. James K. Matthews, Command Historian, USTRANSCOM, with Mr. Michael L. Spehar, USTRANSCOM Airlift Team, TCJ5-AA, 27 Jul 95.)

*On 21 September, USCENTCOM offered USTRANSCOM the use of Cairo West Air Base, Egypt, for airlift crew staging until D-day. Once the fighting commenced, MAC aircraft and crews would need to depart after unloading to make room for other Air Force resources. To avoid disrupting the already functioning airlift system, USTRANSCOM declined the offer.

hours, but the monthly and quarterly limits, at the USTRANSCOM and MAC Surgeon's insistence, remained the same, 150 and 400. As a result, the command used up crew flying hours at a rate higher than anticipated or desired. Although the impact was greatest in August and September 1990, prior to Reserve activation, mission delays, due to crew rest requirements, grew throughout the deployment for both C-141 and C-5 aircraft.[111] "By being denied a stage base," Air Force Major General Vernon J. Kondra concluded, "we reduced our ability for throughput by probably somewhere around 15 to 20 percent," while RAND determined that "the lack of a stage base at a time when aircrews were scarce could by itself explain a 20 to 25 percent shortfall in system performance."[112] Although no major accidents occurred as a result of increased flying schedules, aircraft commanders occasionally requested that missions be delayed or asked that another crew fly a mission because their crews were too tired to fly safely. MAC concluded that lack of an intheater recovery base was the "single worst contributor to crew fatigue and premature accumulation of flying hours."[113]

Overall, MAC's safety record during Desert Shield/Desert Storm, one of the largest and most intense airlift operations in history, should be considered excellent. On 29 August 1990, the command experienced its one and only Desert Shield/Desert Storm catastrophic accident when a C-5 crashed departing Ramstein AB, Germany, for Dhahran via Rhein-Main AB, Germany, with a load of medical supplies, food, and aircraft maintenance equipment. Thirteen of the seventeen personnel on board were killed. Nine of those were reservists with the 433d Military Airlift Wing (MAW), Kelly AFB, near San Antonio, Texas. One 433d MAW reservist survived. All the reservists were volunteers. The other four killed and three injured were active duty Air Force from Ramstein AB and nearby Hahn AB.[114] (See Table III-12.) Air Force investigators later determined, according to *Aviation Week and Space Technology*, that the "uncommanded and inadvertent" deployment of an engine thrust reverser during takeoff probably caused the crash.[115]

In early October, MAC instituted procedures that decreased flying time and thus increased safety. First, the command eliminated the need to use augmented crews in the United States by having military airlift aircraft stop for fueling and crew change at East Coast bases--Westover AFB, Massachusetts, for C-5s and McGuire AFB for C-141s--prior to departure for European en route bases. Second, to slow the rate at which airlift aircrews were accruing flying hours, the command formed C-5 and C-141 pilot pools at Rhein-Main, Ramstein, Zaragoza, and Torrejon. C-5 and C-141 pilots throughout the command went to the European stage bases on three-week assignments. From there, they augmented crews flying to and from the AOR.[116]

Inadequate command, control, communications, and computer systems (C4S) decreased airlift effectiveness. (See also "Deliberate and Execution Planning,"

TABLE III-12

CREWMEMBERS AND PASSENGERS ABOARD C-5A NO. 680228 INVOLVED IN CLASS A MISHAP, 29 AUGUST 1990

FATALITIES

NAME	ORGANIZATION
Maj John M. Gordon, Aircraft Commander	433 MAW, 68 MAS, Kelly AFB TX
Maj Richard W. Chase, Pilot	433 MAW, 68 MAS, Kelly AFB TX
Maj Richard M. Price, Pilot	433 MAW, 68 MAS, Kelly AFB TX
SMSgt Carpio Villarreal, Jr., Flight Engineer	433 MAW, 68 MAS, Kelly AFB TX
MSgt Rosendo Herrera, Flight Engineer	433 MAW, 68 MAS, Kelly AFB TX
TSgt Daniel G. Perez, Loadmaster	433 MAW, 68 MAS, Kelly AFB TX
SSgt Edward E. Sheffield, Loadmaster	433 MAW, 68 MAS, Kelly AFB TX
TSgt Lonty A. Knutson, Crew Chief	433 MAW, 68 MAS, Kelly AFB TX
SSgt Daniel Graza, Crew Chief	433 MAW, 433 OMS, Kelly AFB TX
Capt Bradley R. Schuldt	7 AD, Ramstein AB GE
MSgt Samuel M. Gardner, Jr.	Det 14, 31 WS, Hahn AB GE
SSgt Marc H. Cleyman	Det 14, 31 WS, Hahn AB GE
SSgt Rande J. Hulec	Det 2, 31 WS, Ramstein AB GE

SURVIVORS

Lt Col Frederick K. Arzt, Jr.	62 MAW, McChord AFB WA
MSgt Dwight A. Pettit, Jr.	62 MAW, McChord AFB WA
1st Lt Cynthia A. Borecky	Det 5, 3 WS, England AFB LA
SSgt Lorenzo Galvan	433 MAW, 68 MAS, Kelly AFB TX

SOURCE: MAC Annual History, 1 Jan-31 Dec 90.

and "Intransit Visibility," Chapter II.) A chronic shortage of MAC-assigned High Frequency radio channels meant crews were often unable to notify bases en route and intheater of their arrival time sooner than 30 minutes out, catching Airlift Control Elements (ALCEs) and other base support personnel unprepared. (Average C-5 and C-141 en route station reliability was low, 53 percent and 64 percent, respectively.) ALCEs en route and intheater also lacked sufficient numbers of secure telephones ("STU IIIs") and equipment to receive computerized flight plans. Plans received were frequently unreliable. In one case a crew received a flight plan directing transit over Iraq. MAC's principal computer system for mission preparation and deconfliction, the Flow Generator ("Flogen") could not respond fast enough to airlift requirement changes. As a result, MAC planners and schedulers used pads, pencils, grease boards, and personal computers to help control the deployment flow, a manpower intensive and inherently mistake-prone process. Although the computerized system improved somewhat by mid-September, it remained throughout the operation unable to provide the command a schedule for more than three to five days at a time. Furthermore, MAC did not have the capability to determine where aircraft were on a real-time basis. Its intransit visibility system, the Global Decision Support System (GDSS), could not cope with the data load. According to

General Kondra, GDSS was typically 18 hours behind schedule. It became, for the most part, an after-the-fact source of data.[117]

Greater use of aerial refueling for military airlift aircraft would have helped improve airlift effectiveness. It would have reduced the time that airlift aircraft spent on the ground--General Kondra recorded that C-5s waited for up to ten hours at Al Jubayl for fuel--enabling more of them to cycle through a given base in a given amount of time, and it would have allowed crews to more quickly return to staging bases in Europe. USCENTCOM and USTRANSCOM discussed the possibility of dedicating KC-135 tankers to airlift but rejected the idea for several reasons. Changing airlift schedules were especially difficult to accommodate in lieu of other tanker obligations and inadequate communication links made it difficult to transmit information about changing schedules to allow for new, timely planning. They also considered the poor command and control of incoming aircraft to be a hindrance. Finally, USCENTCOM's Air Force component commander doubted the Air Force's ability to match air refueling qualified crews with air refueled missions: less than 50 percent of MAC pilots were air-refueling qualified and, because of problems with communications systems, MAC found it extremely difficult to track those who were qualified. In general, the high demand for aerial refueling of fighter and other tactical aircraft made it unlikely that there would be KC-135s available for strategic airlift aircraft on a regular basis. As a result, SAC tankers, when available and thus inconsistently, refueled MAC C-141s and C-5s just before landing or shortly after take off, which helped ameliorate congestion at the APODs.[118]

Offload constraints in the AOR decreased throughput. During August and early September, MAC used primarily Dhahran, Al Jubayl, King Fahd, and Riyadh in Saudi Arabia. (See Table II-5.) General Kondra described the problem: "We had plenty of onloads, on any given day about 100 to 105 onloads from about 30 to 35 different locations. That was all going through Europe which was working fine, but there was a bottleneck in the AOR....We had a four-foot opening trying to push airlift through [a] 7,000-mile-long hose and come out a four-inch nozzle at the other end." MAC plans called for up to 34 offload locations in a Desert Shield/Desert Storm-type scenario. In mid-September, USCENTCOM opened up additional bases to MAC, about ten total, and "it took us all the way into November to get our users, especially the Army, to validate offloads for locations other than Dhahran." The Army wanted troops and cargo landed as close to the combat zone as possible because other locations lacked combat support units and Heavy Mobility Equipment Transporters and Heavy Equipment Transports to move troops and equipment forward. Dhahran could eventually handle about 60 airlift aircraft each day, a limit based primarily on the airport's refueling capability, but "we reached a peak of almost 140 total offloads in one day during Phase I, which means that 80 airplanes had to go somewhere else,"[119] and many of the other bases lacked airlift support facilities and equipment.

Quantity and especially the quality of material handling equipment (MHE) complicated offload operations intheater. MAC's 40K loader was 1960s technology and unreliable. In the dry, gritty, sandy climate, seals and gaskets failed at an alarming rate and occasionally slowed the flow by restricting the number of cargo aircraft that could be handled at a base. On 15 August, the commander of airlift forces in the AOR reported that MHE availability as the constraint limiting the number of aircraft allowed on the ground at Dhahran. At one point 1,300 pallets of cargo were backlogged at Dhahran awaiting movement forward because of the lack of loaders and trucks. Aerial port personnel stated that they were lucky to have 50 percent of their MHE working at a time. The wide-body elevator loaders (WBELs) used by MAC for loading commercial cargo aircraft and KC-10s were also in short supply. Moreover, because they were designed to be air transportable, they were not sturdy enough to withstand continuous heavy operations.[120]

A combination of initiatives alleviated offload problems intheater. MAC began managing the airflow to sequence military and civilian aircraft landings in the AOR so they did not arrive in "clumps" saturating air traffic control, communications, and support facilities capabilities, like refueling. To increase refueling capability, USCENTCOM sent a storage system and a fleet of refueling trucks to Dhahran. Most importantly, the Army began to validate airlift for fields other than Dhahran as combat support units and equipment--USCENTCOM's highest priority during much of the Phase II deployment--arrived in the region.[121] As for MHE, the solution would be long term. MAC planned to replace the old model 40K loaders and WBELs with a single system, the 60K loader. It was more efficient, reliable, and deployable. The old loaders required six hours to assemble and four hours to disassemble compared to one hour each for the 60K.[122]

463L Pallets. A chronic short supply of 463L pallets--along with their nets, chains, and straps--threatened throughput throughout much of the deployment.[123] These pallets, 104 inches long and 84 inches wide, with cargo loaded up to 8 feet high and average weights of 2.3 tons, allowed MAC to consolidate cargo for ease of onload and offload. In addition to expediting movement of cargo, their use shortened aircraft ground times. Although it was the responsibility of deploying units to furnish pallets for their cargo, they often turned to MAC for these items. When asked why they did not have pallets to support their deployments, some units replied that they "never expected to actually deploy." The Commander in Chief, US Pacific Command, and the Commander, Air Force Logistics Command (AFLC), believed that exercises, when pallets remained in the field following deployment for use during redeployment, created a mindset among commanders that the items belonged to them as part of their unit equipment.[124] New pallets, once out of the airlift system, were often misused. Some became storage platforms or construction material. In the words of USTRANSCOM's Director of Operations and

Logistics, Air Force Major General Walter Kross, "their use as a field expedient [was] only limited by a soldier's imagination." Others were broken or lost.[125] Headquarters MAC estimated loss rates at 30 percent.[126]

Many served as intermodal devices. (See "Containerization," Chapter VII.) Transporters and logisticians intheater discovered that cargo "containerized" on 463L pallets fit nicely on 2 1/2 ton and 40-foot flat bed trucks. Similarly, they used aircraft tie-down straps, chains, and nets to secure bulk cargo on trucks. Stevedores at Al Jubayl and Ad Damman unloaded breakbulk from ships directly on to 463L pallets for temporary storage and marshaling. Much of the breakbulk ammunition intheater was stored and moved in this manner. At logistical bases inland, Army and Marine Corps units stockpiled their cargo on the pallets in anticipation of orders to move forward quickly by air or land.[127] Pallets were in such short supply that on 22 January, at the height of the air war, Air Force Lieutenant General Gary H. Mears, Director of Logistics on the Joint Staff, sent a "Personal For" message to Army Major General William G. "Gus" Pagonis, Army Central Command's chief logistician; Army Major General James D. Starling, Director of Logistics and Security Assistance, USCENTCOM; and USTRANSCOM's General Kross threatening to enact "draconian measures," including "floor loading" of cargo aircraft, if pallets were not returned from the AOR immediately.[128]

USTRANSCOM and MAC attacked the pallet shortage from several angles. To meet the wartime requirement, MAC representatives intheater, with the Army's assistance, retrieved pallets from inland staging areas for consolidation at airfields. There they cleaned and repaired them for transport via air back to the United States. USTRANSCOM and MAC arranged with the Air Force Logistics Command to increase and expedite construction of new pallets and put into the airlift system 6,000 pallets from the DOD War Reserve Storage. They also reemphasized to users their duty to supply and protect such critical strategic deployment assets.[129] The measures worked, but barely. Right up to the end of the war the Joint Chiefs of Staff, the supported commander in chief, and the supporting commanders in chief feared that the shortage of 463L pallets would break or seriously degrade the strategic airlift to the Persian Gulf.

At war's end, USTRANSCOM and MAC were considering several ways to avoid pallet shortages in the future. They would form recovery teams for deployment to the area of operations early in future contingencies. They also contemplated adopting a "one-time-use" disposable pallet, a recommendation first made by the Air Force in 1968 in response to pallet shortages during the Vietnam War. Designing a "pallet within a pallet" system was another possible option. As envisioned, a 463L-like pallet would enclose a tactical-type pallet that could move forward by surface. The outer pallet could then return to the airlift system for additional loads.[130] The Joint Logistics Board intended to "develop guidance for timely turnaround of pallets and nets," while AFLC wanted to "revise

training scenarios for deploying activities to reflect [the] requirement to return pallet and net assets to the airlift system." The Air Force Directorate of Logistics recommended placing a microchip on each pallet for electronic tracking and revising regulations to more honestly reflect pallet turnaround times, which were from 60 to 90 days during the war compared to a projected time of 25 days.[131] Perhaps the best solution was to consider 463L pallets and their accouterments intermodal assets and simply procure enough of them to satisfy both airlift and theater pipeline needs.

The C-17 Aircraft and En Route Basing for Strategic Airlift Aircraft. The war emphasized the need for the C-17 to replace the aging C-141 and to increase airlift flexibility.[132] The C-17's modern design would give it the capability to move larger quantities of equipment, munitions, fuel, and outsized* cargo directly to forward areas.[133] In his testimony to the US Senate Committee on Armed Services in March 1991, Air Force General Hansford T. Johnson stated:

> Because of its superior fuel efficiency, the C-17 can carry its maximum payload over a greater distance than either the C-5 or C-141. The C-17 can also airdrop outsize cargo. Its lower manpower requirements and reduced operation and support costs make it more efficient, while its exceptional ground maneuverability increases cargo throughput, adding to its effectiveness...if we would have had the C-17 in place of the C-141 during Desert Shield, we could have met our airlift deployment requirements from 20 percent to 35 percent faster, depending on the capacity of the airfields made available in the area of operations. The C-17's impact in the first 12 days alone would have allowed us to carry enough cargo to deploy an additional three F-15, three F-16, three F-4, and three A-10 squadrons plus two light infantry brigades. In addition to its strategic contribution, the C-17 could also have provided the equivalent intheater airlift of a 16 aircraft C-130 squadron.[134]

Furthermore, MAC's analysis of Desert Shield/Desert Storm showed that by replacing 117 C-141s with 80 C-17s during the first 45 days of the operations, the command could have increased strategic lift capability by 28 percent and outsized capability by 25 percent.[135] In summary, the C-17 would mean fewer intertheater missions, fewer crew members, less maintenance as well as additional intratheater capability, and a faster rate of cargo delivery.[136] The Commander in Chief, USCENTCOM, agreed, and consequently he ranked the C-17 aircraft number four (just after "Sealift-Roll-On/Roll-Off Ships") on his list of 80 funding priorities.[137]

Army General Edwin H. Burba, Jr., Commander in Chief, Forces Command (FORSCOM), also ranked the C-17 high on his list of priorities and linked it to

*For a definition of "outsize" and "oversize" cargo, see "Civil Reserve Air Fleet," this chapter.

en route basing. Following Desert Shield/Desert Storm, he told the Chairman, Joint Chiefs of Staff (CJCS), that "with the decline in the number of forward based forces and supporting bases, procurement of C-17s is essential for rapid response to quickly developing scenarios." He added that "the increased capacities and versatility of the C-17 will greatly expand worldwide airfield access and will complement flexible needs of the Army."[138]

For General Johnson, as with General Burba at FORSCOM, Desert Shield/Desert Storm underscored the importance of en route bases for strategic deployment. Intheater airfields, although well-developed by most standards, lacked sufficient ramp space and support facilities such as fueling, billeting, and cargo handling.[139] Consequently, MAC relied heavily on bases in Europe for such services, which were stressed to the limit. Ramp congestion became so serious at times that airlift aircraft had to be towed into and out of parking. The percentage of airlift missions transiting European bases in support of the operation follows: Torrejon AB, Spain, 31 percent; Rhein-Main AB, Germany, 27 percent; Zaragoza AB, Spain, 18 percent; Ramstein AB, Germany, 14 percent; Royal Air Force Mildenhall, England, 6 percent; and Rota, Spain, 4 percent.[140] The only major structural repair facility for C-5s and C-141s, Rhein-Main had as many as 40 such aircraft on the ground at a time. Together, Torrejon and Rhein-Main serviced up to 100 strategic airlift aircraft with two million gallons of fuel per day. During December 1990, MAC averaged 50 missions per day from Torrejon (compared to 50 per week in peacetime) and 25 missions per day from Zaragoza. Missions at those two Spanish bases peaked at 90 and 35, respectively. The record number of strategic airlift aircraft on the ground at Torrejon during Desert Shield/Desert Storm was 68.[141] Consequently, General Johnson, in a letter to Secretary of Defense Richard B. "Dick" Cheney, stated emphatically that the United States "must retain both a Central European and an Iberian Peninsula base" and requested that USTRANSCOM be consulted on base closure issues "affecting the global strategic mobility mission."[142]

Surprisingly, General Johnson saved his harshest criticism of en route support for United States Air Forces Europe (USAFE) operations at Torrejon. To verify the horror stories he had been hearing, General Johnson visited the air base in mid-September where he was "treated very, very shabbily." He found MAC crews being

> treated more as a profit potential for the base's MWR [Morale, Welfare, and Recreation] office than as members of the Air Force team....The base had closed the Officers' Club and stopped selling beer in the billeting office. They then opened up a beer sales shop with jacked-up prices. They provided few opportunities for our people to eat. They put them three to a room to get higher rates for their rooms, while Air Force members from other commands stayed

one to a room. We were treated worse than any foreign country would treat us.

He "got that squared away" by calling his former Air Force Academy classmate and friend Air Force General Robert C. Oaks, Commander in Chief of USAFE. According to General Johnson, he and General Oaks "went down a long list of things that needed fixing, and the support got better very quickly." He noted that USAFE was not the only Air Force major command to treat MAC airlifters as second class citizens during Desert Shield/Desert Storm. After the war, when it was too late to do anything about it, he discovered that "MAC people who went into Dhahran were not given access to quarters. They were not allowed to eat in the TAC [Tactical Air Command] dining hall. One MAC unit had to go to the 82d Airborne [Division] to find quarters." Overall, General Johnson was disappointed in the way the Air Force treated MAC at en route and intheater bases during the operation.[143]

Civil Reserve Air Fleet. USTRANSCOM and MAC learned much about the Civil Reserve Air Fleet (CRAF) during Desert Shield/Desert Storm. On the one hand, CRAF aircraft were less flexible than MAC aircraft. MAC estimated that about 85 percent of the cargo carried by air during Desert Shield/Desert Storm (approximately 462,015 tons) could not fit on or was extremely difficult to load on civil aircraft. Of that amount, about 60 percent was oversize (277,210 tons), that is cargo exceeding the dimensions of a 463L pallet (see "463L Pallets," this chapter) but still able to fit in a C-141: less than 1,090 inches long, 117 inches wide, and 96 inches high. The remainder (184,805 tons) was "outsize," meaning it could fit only on C-5s.[144] On the other hand, wide-body commercial aircraft were especially suited to carrying passengers and palletized bulk cargo for sustainment operations. For example, the Boeing-747, the workhorse of the commercial cargo fleet during Desert Shield/Desert Storm (see Table III-7), could hold 46 463L pallets, depending on the configuration, compared to 36 for the C-5 and 13 for the C-141. Thus one of the B-747s could carry as much bulk cargo as three or four C-141s.

While average delays for CRAF narrow body aircraft were similar to those for the C-141 (see "US Strategic Airlift Fleet," this chapter), commercial wide-body aircraft were on the whole much more likely to meet their scheduled take off and arrival times than their military counterparts, for two primary reasons. First, commercial aircraft, under the CRAF contract, were obligated to provide a certain capability. If an aircraft broke down, the carrier was required to find a replacement. Thus the CRAF aircraft showed few logistics delays. Second, commercial aircraft flew the majority of their missions in channel operations. The regular, predictable nature of channel operations allowed the commercial aircraft to achieve low average ground times compared to the C-141 and C-5 aircraft (see "Mail, Gifts, and Channel Airlift," this chapter).

Although the CRAF program functioned superbly during Desert Shield/Desert Storm, USTRANSCOM and MAC believed it could be refined. As shown in Table III-13, a proposed CRAF restructuring would give USTRANSCOM and MAC increased cargo lift in Stage II. It would also give the commands, for the first time, an aeromedical option in Stage II.[145]

TABLE III-13

CIVIL RESERVE AIR FLEET PROPOSED RESTRUCTURING (CURRENT/PLANNED SIZING)

TYPE AIRCRAFT	STAGE I	STAGE II	STAGE III
Cargo	23/30	40/75	Unlimited
Passenger	18/30	77/75	225/225
Aeromedical	0/0	0/25	85/45
TOTAL	41/60	117/175	310/270

SOURCE: Military Airlift Command, Plans and Programs, Readiness, Civil Air and Operability Plans (MAC/XPXO).

US airline companies and their employees had a long list of lessons learned from Desert Shield/Desert Storm. William D. Slattery, Executive Vice President for Operations, Northwest Airlines, requested that MAC give the airlines more notice of impending activation. "A 24-hour or 48-hour notice is not long enough...to set up an adequate support structure," he emphasized. In that vein, he recommended that in future contingencies CRAF operate from hubs, such as Frankfurt, Germany, or John F. Kennedy IAP, which would increase lift capability by incorporating into CRAF the airlines regularly scheduled flights.[146] According to Evergreen International Airlines, Desert Shield/Desert Storm reconfirmed that commercial airlines must position their own support personnel en route and in the area of operations.[147]

Captain John Saux, Airline Pilots Association, offered several other suggestions for CRAF improvement. He noted (as stated earlier) that at the beginning of Desert Shield the airlines had difficulty assessing their capability to crew CRAF over and above reserve crew commitments, as required under the CRAF program. His organization would work with the airlines to rectify the problem. He recommended that instead of issuing blanket waivers and letting the mission fit the waiver, MAC should look at each mission and waive requirements only as needed. For example, waiving the length of the duty day for MAC crew members, whose average age was 30, worked fine, but it was tough on CRAF crew members, whose average age was closer to 55. On the one hand, Captain Saux recommended that MAC and the Department of Transportation (DOT) restrict hazardous materials to military aircraft because CRAF crews were not trained to handle them. (MAC recommended that CRAF carriers establish their own training programs to carry hazardous materials up to and including Class A

explosives.) On the other hand, he wanted the military to train CRAF crews in Tactical Aid to Navigation and other precision radar equipment and methods. Lack of such expertise had caused some CRAF pilots to "refuse to make precision radar approaches" during Desert Shield/Desert Storm. Lack of proper charts and ultra-high frequency-equipped aircraft had also greatly complicated their job. Finally, he wanted the military to issue CRAF crews special purpose gear, such as chemical warfare protective clothing,* prior to or immediately upon activation.[148]

On this last issue, General Johnson admitted a lack of foresight. "Quite frankly, I didn't do well in anticipating CRAF crew apprehensions resulting from watching CNN [Cable News Network]," he told his command historians following the war. "We had crews who would hear and see SCUDS [surface-to-surface missiles] falling all over and sometimes they were reluctant to go. Unfortunately," he continued,

> we had decided that we wouldn't give the carriers chemical gear prior to their flight, but rather we would give it to them when they landed in the AOR [USCENTCOM area of responsibility]. Several times we dropped the ball, and...normally it was when we were going into a potentially dangerous airfield.

Eventually MAC prepositioned chemical gear at en route stations so CRAF crews could try it on and become familiar with it. "Looking back," General Johnson concluded, "I should have initiated such procedures early in the deployment."[149]

Concerns foremost on the minds of airline executives were monetary. Airlines that volunteered their services prior to CRAF activation felt that it was unfair for MAC to exclude them from military business after activation. Several complained that during the operation the military co-opted their aircraft only to let them sit idle for several days before deployment. In some cases, planes were pulled out for CRAF, but never used. Days would pass before the carriers were informed their planes were not needed. A familiar complaint was lack of logistical support en route and in the AOR. Airline representatives argued that their companies lost the goodwill of their paying customers due to canceled flights. This in turn strengthened the competitors' edge. Overall, they felt that their participation in Desert Shield/Desert Storm would result in long term losses in both the passenger and cargo business. Now that the airlines understood the real cost of the CRAF program, they were questioning their future participation in it.[150]

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*Airline pilots' comrades in military uniform registered similar complaints. In regard to chemical warfare defense, the Headquarters MAC Desert Shield Lessons Learned Working Group recorded a lack of manning, funding, training ("particularly non-mobility types"), visibility over equipment, information on the enemy's capabilities, and clear communication of policies and procedures. (SOURCE: Rpt (U), Col J. D. Graham, et al., "Desert Shield Lessons Learned Working Group," n.d.)

The drawdown of US forces in the post-cold war era and a likely decrease in peacetime DOD airlift business for the airlines resulting from it also led airline executives to view CRAF participation as a possible liability. As a result, several of them petitioned the Secretary of the Air Force for "additional incentives such as tax breaks, enrollment fees, and landing rights" at military bases. They also suggested that the Air Force "increase the amount of peacetime business by greatly reducing the use of military aircraft to carry cargo by making the award of MTMC [Military Traffic Management Command] and GSA [General Services Administration] passenger contracts contingent on CRAF participation."[151]

MAC considered several ways to strengthen incentives for participation in the CRAF program. New contracts would institutionalize volunteers so that volunteers remained in the system following an activation. Contracts would guarantee utilization if called up and a reasonable release if not called up. They would make the peacetime uniform rate the basis for war rates, guarantee an eight-hour day if called up, and recognize additional costs of activation and lack of backhaul in war.[152] Finally, in the future MAC would institute Senior Lodger, a Stage II program during Desert Shield, upon activation of Stage I. Through the program, the command would designate a CRAF carrier as a Senior Lodger at each en route base to provide support--fuel, material handling equipment, intelligence, chemical warfare protective clothing, food, and billeting--to all CRAF carriers as they transited that location.[153]

Despite CRAF's tremendous showing during Desert Shield/Desert Storm, General Johnson considered the program's future "very uncertain" owing to the economic precariousness of many US airlines. Several filed for bankruptcy during the war and several others might soon follow. He cited as an example Pan American World Airways, which accounted for 10 percent of CRAF's wartime passenger airlift capability and 11 percent of its wartime cargo capability. He feared that "this potential loss may not be absorbed by other carriers." More importantly, the health of the US airlines industry was an issue of national security. The Department of Defense did not want the US airline industry to go the way of the US maritime industry. More to the point, it did not want to depend on foreign flag airlines for deploying and sustaining American troops in emergencies. (See "Foreign Flag Balkers," Chapter IV.)[154]

Commercial Airlift Insurance Coverage. It was of utmost importance to MAC and USTRANSCOM that air carriers supporting the deployment to the Persian Gulf receive government insurance coverage when the airlines' commercial insurance underwriters, desiring to limit their liability, canceled peacetime contracts or rewrote them with prohibitively high premiums. Without it, CRAF carriers likely would not fly. The government had two methods of providing coverage: insurance under Title XIII of the Federal Aviation Act of 1958 and

indemnity coverage under Public Law (PL) 85-804. The former became available when the President determined that air operations into a war zone were essential to US foreign policy. Title XIII covered only international flights and stipulated that commercial coverage had to be either unavailable or cost prohibitive.[155]

Insurance under Title XIII could be issued in two forms: premium and non-premium. The government issued premium insurance to air carriers for regularly scheduled commercial service or charter service when a US government organization was not the contracting agency. The Secretary of Transportation in consultation with the Secretary of State recommended issuance of premium insurance. The insured paid premiums into the Aviation Insurance Revolving Fund (AIRF), which was used to pay Title XIII claims. The government issued non-premium insurance to carriers performing contract operations of a US government agency. The agency requesting the coverage needed to have an indemnifying agreement with the Secretary of Transportation stating that the contracting agency would repay the AIRF for any claims resulting from its charter operations. Title XIII insurance could be issued to domestic or foreign carriers.[156]

Public Law 85-804 was not an insurance program. Rather, it was a third-party claims process designed to protect contractors from unusually hazardous activities. The process started with the Secretary of the Air Force obligating the government to pay any claim incurred by a contractor while performing commercial airlift services for MAC, assuming the claim had been determined to be no fault of the operating carrier, and the claim was not covered first by a carrier's commercial insurance or Title XIII insurance.[157]

On 7 August 1990, insurance underwriters informed civil airlift carriers that, due to the increased risk of operating in the Persian Gulf region, they would likely begin canceling policies. MAC and the Federal Aviation Administration (FAA) immediately took steps to gain Title XIII coverage. FAA issued the first non-premium policy on the 10th to an Eastern Airlines charter. The agency issued the first premium policy to Tower Air for a charter operated as a backhaul mission after it completed a MAC deployment mission to the area of operations. By the end of the war, FAA had issued approximately 5,000 policies under Title XIII. The government paid out on no claims.[158]

MAC experienced difficulty in gaining coverage for donated foreign lift. Korea and Japan continued to pay premiums for their carriers from the start of Desert Shield until insurance rates increased dramatically at the start of hostilities. At that time, KAL limited its operations to areas outside the insurance restriction area while the Japanese requested non-premium coverage under Title XIII so its Evergreen International Airlines charters could continue flights into the war zone. The FAA denied the request because the contract was between Japan and Evergreen, not between MAC and Evergreen. The Japanese then requested

premium Title XIII insurance and were again stymied, this time by the Office of Management and Budget (OMB). The OMB concluded that under the Gramm-Rudman-Hollings Act the risks would have to be charged against non-defense accounts, which OMB found unacceptable. As a result, MAC had to convert all Evergreen flights to MAC contract charters at a cost to the US taxpayers of approximately $300,000 per mission. Additionally, because of the OMB ruling, the AIRF lost out on a $40,000-per flight premium payment. Because the flights were put under MAC contract they became eligible for non-premium Title XIII coverage.[159]

US carriers voiced several concerns with Title XIII. It applied only to international flights but the carriers believed they faced saboteur and terrorist threats in the United States. Additionally, they felt it was as risky carrying hazardous material on domestic flights as it was overseas. Furthermore, Title XIII did not cover miscellaneous risks that commercial insurance normally included, such as costs associated with search and rescue; removal of wreckage; confiscation of aircraft; foaming of runways prior to crash landings; and damage to aircraft spare parts and mission support equipment deployed into the war zone. Although MAC concluded that PL 85-804 indemnity would provide for many of these risks, MAC and its contractors acknowledged the process for payment could take years. Of greater concern was the amount of money in the AIRF, only $50 million when a single jumbo jet was worth in excess of $100 million. There would likely also be claims for loss of life and property damage. To increase the amount of money in the pot would take an act of Congress.[160]

Similarly, MAC and commercial carriers considered the PL 85-804 process to be lacking. It took from 12 August to late in the day of 17 August for MAC to gain the Secretary of Air Force's approval for claims under the law. By that time, nearly half of the CRAF Stage I underwriters had invoked their CRAF exclusionary clauses. Technically, then, those CRAF carriers flew their domestic legs that day uninsured. Additionally, the government was not required to settle a claim until 60 days after it received the required documentation. Worse yet, PL 85-804 had a $25 million ceiling and funds to pay even that amount would have to come out of the AIRF. Following the war, the Department of Defense and Department of Transportation agreed to revamp the government's war risk insurance coverage for the CRAF to make it more responsive and flexible to the needs of the nation.[161]

Airlift Sustainment Cargo Backlog. One of USTRANSCOM's most intractable and high-visibility problems during Desert Shield/Desert Storm was a backlog of sustainment cargo at aerial ports of embarkation, primarily in the United States. The cause was twofold: the transportation customers' abuse of the priority system and an airlift fleet not large enough to carry both air-eligible unit cargo and air-eligible sustainment cargo. It was in the second phase of the deployment, when the forces in the desert reached substantial numbers with a resulting

demand for resupply, that the backlog became a critical concern throughout DOD. Anticipating the airlift shortfall, USCENTCOM in mid-November 1990 issued the following logistics guidance to the unified commands and services: "move 90 percent of sustainment by sea and 10 percent by air, except class IX (repair parts), which will be 10 percent by sea and 90 percent by air." In response, USTRANSCOM conducted airlift sustainment projections and a trend analysis of cargo airlifted since mid-October. Taking into account Christmas mail, USTRANSCOM told USCENTCOM that it could expect a total airlift sustainment requirement of 1,200 tons per day.[162]

By the end of November sustainment air cargo was increasing at faster than predicted rates. USTRANSCOM's Director of Operations and Logistics, General Kross, told General Starling, USCENTCOM's Director of Logistics and Security Assistance, that unless they decreased substantially the amount of cargo coded for airlift and begin coding much more of it for sealift, sustainment backlogs would develop at aerial ports in December and January as the airlift fleet shifted from resupply operations to higher priority unit cargo movements. He also pointed out that less than one third of cargo at aerial ports had been properly cleared and documented for airlift as prescribed by DOD's Military Standard Transportation and Movement Procedures (MILSTAMP). (MAC estimated that documentation deficiencies decreased throughput by 10 to 15 percent at major aerial ports of embarkation and debarkation. See also "Special Middle East Sealift Agreement," Chapter VI.) Consequently, General Kross told shippers that they "must submit advance transportation control and movement data documentation to sponsoring service air clearance authorities prior to moving cargo to aerial ports."[163]

These efforts were to no avail. The first week of December, US Army Depot Systems Command, Chambersburg, Pennsylvania, reported to its higher headquarters, Army Materiel Command, that it was receiving for air shipment "bulk quantities of sand bags, fence posts, toilet paper, T-shirts, mittens, sweat shirts, and admin[istrative] supplies." Overall, the Army Chief of Staff estimated that his service was coding nearly half of its sustainment cargo destined for the Persian Gulf as "required delivery date (RDD) '999--the highest priority.'" He warned the Commander, Army Central Command, and Commander in Chief, Forces Command, that "at backlog rate, we may soon find that even '999' will not secure channel cargo space on departing aircraft inside of 2-3 days." The other services were equally guilty. Both the Air Staff and Chief of Naval Operations Staff estimated that half of their sustainment cargo was being coded "999-highest priority." On 6 December General Johnson told Secretary Cheney that air sustainment cargo requirements were "approximately 300 tons per day above available lift."[164]

The Joint Chiefs of Staff's Joint Transportation Board (JTB) met on 9 December at the National Military Command Center in Washington, D.C., to discuss the

problem. Following USTRANSCOM's advice, as briefed by General Kondra, MAC's Deputy Chief of Staff of Operations, and Army Colonel Edward T. Fortunato, USTRANSCOM's Deputy Director of Logistics, USCENTCOM established daily sustainment airlift allocation of 1,250 tons per day, as follows: Army, 425; Air Force, 190; Navy, 105; Marine Corps, 40; Defense Logistics Agency (DLA), 40; US European Command, 150; and Mail, 300. Also, as approved by the JTB, USTRANSCOM initiated Sealift Express out of the United States (see "Special Middle East Sealift Agreement," Chapter VI). In Europe, where a backlog was beginning to cause concern, it established European Desert Express for war-stopper air-eligible cargo and added a second channel mission for mail out of Rhein-Main AB, Germany.[165] (See "Mail, Gifts, and Channel Airlift," this chapter.)

At the JTB's direction, USCENTCOM sent "diversion teams" to Dover AFB, Delaware, and Tinker AFB, Oklahoma, MAC's primary aerial ports of embarkation for cargo. Headed by colonels and composed of representatives from the services and USCENTCOM, the teams reprioritized cargo on-hand and challenged the priority of cargo coming into the facilities. Medical supplies, tents, cots, sleeping bags, critical repair parts, and mail topped their list of air-eligible cargo. Cargo that did not meet the criteria for air shipment was loaded on trucks, using 463L airlift pallets, for transport to Consolidation and Containerization Points--Bayonne, New Jersey, for Dover and Robins AFB, Georgia, for Tinker--for packing into containers. From Robins, the containers moved onward by truck to Savannah, Georgia. At Savannah and Bayonne, stevedores loaded the containers on ships destined for the Persian Gulf. USCENTCOM also sent a diversion team to DLA's Defense Depot at Mechanicsburg, Pennsylvania, to screen cargo prior to its arrival at the airports and divert it to seaports if it failed to pass the "999" test. Diversion team operations were felt almost immediately: within days after their arrival at Dover, members reported diverting nearly 1,300 tons of rations to sealift, which was roughly equivalent to 63 C-141 missions.[166]

The success was short-lived. Over the next several weeks, as the military airlift fleet began to surge in support of unit deployments, the sustainment backlog accumulated at unprecedented rates. Even the diversion teams and activation of CRAF Stage II on D-Day, 17 January 1991 (16 January, 1900 EST), did not alleviate the problem. On the 21st, USTRANSCOM estimated that since the beginning of hostilities backlogs had increased by 300 percent worldwide. General Johnson reported to Army General Colin L. Powell, Chairman, Joints Chiefs of Staff (CJCS), that "the sustainment backlog now exceeds 6,700 tons (100 C-5 equivalents)." Dover AFB recorded a record backlog of just under 3,600 tons on the 21st with nearly 65 percent of all cargo on-hand coded 999. Two days later, on the 23d, the backlog in the United States peaked at nearly 10,300 tons. Similar problems existed overseas. The Navy, for example, was particularly concerned about Cubi Point, Philippines, where the

sustainment channel to Al Fujayrah, United Arab Emirates, was backlogged 518 tons on 21 January.[167]

In effect, the peacetime airlift priority system, when tested during the wartime tempo operations of Desert Shield/Desert Storm, broke down. As practiced in peacetime, the services' Air Clearance Authorities cleared cargo for airlift and electronically transmitted that information to MAC which, in turn, passed it on to the aerial ports. Air Clearance Authorities, however, admitted that they were incapable of keeping their services' allocations within prescribed limits. For example, the Army's allocation of 425 tons was often reached within the first three hours of the day. Told they would not receive air clearance, shippers ignored established procedures and sent their cargo directly to the aerial ports. As a result, the aerial ports were overwhelmed and legitimate high-priority cargo was delayed.[168]

A combination of USCENTCOM and USTRANSCOM initiatives began to decrease the backlog during the last week of January. Reduction of aircraft ground times, conversion of three civilian wide-body aircraft from passenger to cargo, expansion of diversion team operations to all major aerial ports in the United States, an additional daily channel for the Navy out of Cubi Point, and incorporation of Navy C-9, Air Force Systems Command C-141, and Coast Guard C-130 aircraft into the airlift flow helped. To expedite movement of backlogged mail, USCENTCOM requested that families and friends of servicemen deployed for Desert Storm limit personal mail to first class letters and audio cassettes. Additionally, USTRANSCOM initiated mail channels out of Rhein-Main AB, Germany, and McGuire AFB, New Jersey. (The commands considered, but did not use, CRAF Stage III, large numbers of foreign aircraft, and Fast Sealift Ships for diverted air cargo.) What eventually ended the crisis, however, was the increasing number of commercial aircraft available for sustainment lift. At the end of the holiday season, the airlines began to volunteer aircraft for Desert Shield service so that by early February USTRANSCOM had in its airlift force 78 commercial Long Range International (LRI) cargo aircraft (40 CRAF and 38 volunteers).[169]

In regard to the aerial port backlogs, USTRANSCOM made several recommendations for future operations. The CJCS should direct theater commanders to implement cargo allocation systems upon execution of contingency operations. The command believed that the services needed to be reminded early on that airlift was a precious commodity and priority discipline was their responsibility. The CJCS should also consider deploying diversion teams to aerial ports of embarkation at the outset of contingencies.[170]

CHAPTER III NOTES

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Vice Admiral Francis R. Donovan, USN
Commander, Military Sealift Command
March 1990-August 1992

CHAPTER IV

SEALIFT

OVERVIEW

America's Desert Shield/Desert Storm sealift accomplishments were as impressive as those of airlift, thanks in great part to United States Transportation Command (USTRANSCOM) and its Navy component command Military Sealift Command (MSC). At the height of the sealift, on 31 December 1990, 217 ships--132 en route, 57 returning, and 28 loading or unloading--formed a virtual "steel bridge" across the Atlantic Ocean. This equated to approximately one ship every 50 miles from Savannah, Georgia, to the Persian Gulf. By the end of the war, 459 shiploads had moved 945,000 pieces of unit equipment totaling nearly 32.7 million square feet--enough tanks, trucks, ammunition, and foodstuffs to cover every square foot of 681 football fields. Unit equipment sealifted to the United States Central Command (USCENTCOM) area of responsibility (AOR) totaled nearly 2.43 million tons. (A summary of unit cargo sealifted by shipping source is at Table IV-1.) Another 616,700 tons of sustainment dry cargo traveled by sea. Mostly containerized and shipped on regularly scheduled commercial liners, it equated to about 37 container ships (2,000 20-foot equivalent size). In all, the command transported about 9.2 million tons of cargo by sea (3.1 dry and 6.1 petroleum products) to the Persian Gulf during Desert Shield/Desert Storm, as shown in Table II-1.[1] (See "Strategic Lift Accomplishments," Chapter II.)

At war's end, the sustainment pipeline was open. Just prior to R-Day, 10 March 1991 (beginning of redeployment), 70 shiploads of cargo, totaling 469,608 tons, were en route to the USCENTCOM AOR, as shown in Table IV-2 and Appendix 4. (Only a small percentage of this cargo was delivered as planned. The remaining loads, termed "U-Turns," moved instead to various ports in the United States, Europe, or Pacific.) Fifty-five of the 70 shiploads carried ammunition totaling 418,143 tons, 51 percent of the total ammunition loaded for transport by sea (824,197 tons) during Desert Shield/Desert Storm. Another 1,000 rail cars of ammunition and explosives were at Military Ocean Terminal, Sunny Point (MOTSU), North Carolina, awaiting shipment to the Persian Gulf.[2] Obviously, the United States was prepared to fight a longer war.

A Navy modernization program in the 1980s made possible the nation's sealift achievements during the war. Early in the decade, the Navy formally recognized strategic sealift as a major naval function along with sea control, power projection, and strategic deterrence. Soon thereafter, the service began acquiring and converting sealift ships capable of transporting a mechanized division to Europe in five days or the Persian Gulf in two weeks. In all, over the next ten years, the Navy spent approximately $7.4 billion on strategic sealift and in return

TABLE IV-1
DESERT SHIELD/DESERT STORM STRATEGIC SEALIFT OF UNIT EQUIPMENT BY SHIPPING SOURCE
(Ship Loads Delivered As Of 10 March 1991)

	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR (1-10)	TOTAL
Fast Sealift Ships (FSS)									
Short Tons	56,009	35,315	67,511	37,110	45,954	61,410	18,632	0	321,941
Percent Cargo	22.14	14.01	20.65	17.98	12.91	8.62	6.25	0	13.24
Square Feet	591,121	407,163	938,663	715,485	888,324	711,335	308,561	0	4,560,652
Ship Loads	5	3	6	5	6	5	2	0	32
Prepositioning Ships (PREPOS)									
Short Tons	101,678	11,491	0	25,270	0	33,313	35,084	0	206,836
Percent Cargo	40.19	4.56	0	12.24	0	4.68	11.78	0	8.51
Square Feet	889,885	82,270	0	212,565	0	289,129	161,625	0	1,635,474
Ship Loads	8	3	0	3	0	3	3	0	20
Maritime Prepositioning Ships (MPS)									
Short Tons	95,327	10,400	26,345	19,296	73,513	20,043	12,520	0	257,444
Percent Cargo	37.68	4.13	8.06	9.35	20.65	2.81	4.20	0	10.59
Square Feet	1,200,000	150,000	343,998	351,170	890,135	380,526	249,639	0	3,565,468
Ship Loads	8	1	3	3	7	2	2	0	26
Ready Reserve Force (RRF)									
Short Tons	0	123,046	103,649	76,138	112,959	195,074	72,963	7,219	691,048
Percent Cargo	0	48.83	31.70	36.89	31.73	27.38	24.49	26.53	28.42
Square Feet	0	1,576,225	1,651,454	949,008	1,373,051	2,309,576	1,069,051	53,217	8,981,582
Ship Loads	0	18	20	12	22	35	14	2	123
US Flag Commercial									
Short Tons	0	55,006	38,262	15,441	38,599	115,714	44,077	1,186	308,285
Percent Cargo	0	21.83	11.70	7.48	10.84	16.24	14.80	4.36	12.68
Square Feet	0	499,599	587,239	298,606	810,474	1,273,138	405,169	Unavailable	3,874,225
Ship Loads	0	7	10	3	12	19	10	1	62
Foreign Flag Commercial									
Short Tons	0	16,755	91,163	33,161	85,000	286,819	114,612	18,805	646,315
Percent Cargo	0	6.65	27.89	16.07	23.88	40.26	38.48	69.11	26.58
Square Feet	0	269,956	1,776,868	527,496	1,596,313	4,209,090	1,437,064	257,187	10,073,974
Ship Loads	0	5	32	10	29	85	31	4	196
TOTAL									
Short Tons	253,014	252,013	326,930	206,416	356,025	712,373	297,888	27,210	2,431,869
Square Feet	2,681,006	2,985,213	5,298,222	3,054,330	5,558,297	9,172,794	3,631,109	310,404	32,691,375
Ship Loads	21	37	71	36	76	149	62	7	459

SOURCE: Military Sealift Command (MSC) Lift Summary Reports.

TABLE IV-2

DESERT SHIELD/DESERT STORM
TOTAL AMMUNITION DELIVERED BY SHIPPING SOURCE
(As of 10 March 1991)

SHIPPING SOURCE	STONS DELIVERED	SHIP LOADS
Ready Reserve Force	182,607	17
US Flag*	134,823	14
Foreign Flag	88,624	17
TOTAL	406,054**	48

AMMUNITION EN ROUTE BY SHIPPING SOURCE
(As of 10 March 1991)

SHIPPING SOURCE	STONS EN ROUTE	SHIP LOADS
Ready Reserve Force	109,150	16
US Flag*	89,341	12
Foreign Flag	219,652	27
TOTAL	418,143	55

418,143	Ammunition Short Tons En Route	=	89% of Total Dry Cargo En Route was Ammunition
469,608	Total Short Tons Dry Cargo En Route (As of 10 March 1991)		

*Includes Afloat Prepositioning Force ships in common-user role.

**Does not include ammunition in Unit Basic Loads carried by sea or ammunition moved via air.

SOURCE: Military Sealift Command (MSC) Lift Summary Reports.

received, through purchase or lease, 96 Ready Reserve Force ships, 25 Afloat Prepositioning Force ships, 8 Fast Sealift Ships, 2 aviation logistics support ships, and 2 hospital ships.[3]

OPERATIONS

Afloat Prepositioning Force: Prepositioning Ships and Maritime Prepositioning Ships. The Commander of the US Navy's Seventh Fleet put the Desert Shield sealift into motion when he ordered the Afloat Prepositioning Force (APF) to get underway.[4] The Afloat Prepositioning Force consisted of 13 Maritime Prepositioning Ships and 12 Prepositioning Ships (PREPOS). The Maritime Prepositioning Ships were divided into three Maritime Prepositioning Squadrons (MPSs), one each based in the Atlantic Ocean (MPS-1), Indian Ocean (MPS-2), and Pacific Ocean (MPS-3). (See Appendix 5.) Each squadron was capable of equipping and supplying a Marine Expeditionary Brigade (MEB) of approximately 16,500 Marines for 30 days. A typical MPS Squadron hauled 50 M-60 tanks, 100 Assault Amphibious Vehicles, 30 light armored vehicles, 40 155mm howitzers, 300 5-ton trucks, and 1.5 million meals. Both MPS-2 and MPS-3 were alerted for possible deployment on 7 August for the first ever wartime test of the Afloat Prepositioning Force. On 15 August, MPS-2 Roll-On/Roll-Off (RO/RO) vessels MV *PFC James Anderson, Jr.*, MV *1ST LT Alex Bonnyman*, and MV *CPL Louis J. Hauge, Jr.*, the first ships to arrive in the AOR in support of Desert Shield, began unloading their cargo at Al Jubayl, Saudi Arabia. They carried equipment and supplies for the 7th MEB, whose troops were arriving in the AOR via air. All five ships of MPS-2 had arrived intheater by 5 September. The four ships of MPS-3, supporting the 1st MEB, began arriving in the AOR on 25 August. They closed on 30 August. Supporting elements of the II Marine Expeditionary Force (MEF), the four ships of MPS-1 arrived in the AOR on 13 December. After their initial prepositioning voyages, seven of the thirteen Maritime Prepositioning Ships were turned over to USTRANSCOM as common-user transport ships (one in MPS-1, five in MPS-2, and one in MPS-3). While intheater and not being employed as common-user assets, Maritime Prepositioning Ships served as floating ammunition and fuel platforms and in other sea-based logistics roles.[5]

Long-term Military Sealift Command charters, the Prepositioning Ships of the Afloat Prepositioning Force began arriving in Saudi Arabia from Diego Garcia on 17 August, as shown in Appendix 6. (One of the 12 ships was stationed in the Mediterranean. All were controlled administratively from the Indian Ocean island.) Carrying Army and Air Force equipment and supplies, they included four tankers and eight cargo ships. After delivering their initial loads, seven of the cargo vessels began serving as common-user strategic transports. The eighth PREPOS remained in the theater as a USCENTCOM asset. All four tankers eventually served in the common-user role. Military Sealift Command withdrew two of the tankers from the prepositioning force for common-user service at the

outset of Desert Shield. The other two operated in the AOR under USCENTCOM throughout most of Desert Shield. They completed their first common-user voyages by mid-January 1991, just prior to D-Day, 17 January 1991 (16 January, 1900 EST).[6]

The APF's contribution to Desert Shield/Desert Storm was considerable. On their first Desert Shield voyages, serving in their prepositioning role, the APF ships delivered 281,305 tons of unit cargo to the AOR (116,977 tons by Prepositioning Ships and 164,328 tons by Maritime Prepositioning Ships), as seen in Appendices 5 and 6. Overall, in its prepositioning and common-user roles, the APF carried 19 percent of Desert Shield/Desert Storm unit cargo (8.5 percent Prepositioning Ships and 10.5 percent Maritime Prepositioning Ships), as depicted in Table IV-1.[7]

Fast Sealift Ships and the *Antares* Casualty. The eight ships from MSC's Fast Sealift Ship (FSS) fleet began arriving in the AOR soon after the APF. USTRANSCOM ordered MSC to activate three of the FSSs on 7 August and the remaining five on 8 August. (See Appendix 7.) Maintained in a reduced readiness status that allowed for activation in 96 hours or less, each carried a skeleton crew of about a dozen merchant mariners kept on a four-day steaming notice. A full crew numbered about 40. FSSs had both container and RO/RO capability. A series of ramps allowed wheeled and tracked vehicles to be driven on and off. Thus they were ideal for carrying unit equipment. Also, two sets of twin cranes, one amidship and one aft, lifted cargo on and off.[8]

FSSs were huge by almost any standard. Measuring 946 feet long, almost as long as an aircraft carrier, each ship could carry about 1,000 pieces of equipment. One FSS load was roughly equivalent to 213 C-5 aircraft loads. Designed for a maximum speed of 33 knots, FSSs were also fast for cargo ships. (FSSs during Desert Shield/Desert Storm actually averaged about 23 knots due primarily to bad weather and navigational considerations such as speed limitations in the Suez Canal.) Five of the FSSs, due to their high speeds, were able to complete three deliveries each in Phase I. No other shipping source did so.[9]

The ships' layberths were widely dispersed. The *Algol* and *Bellatrix* were in Galveston, Texas; the *Pollux* and *Regulus* were in Violet, Louisiana; the *Altair* was in Hampton Roads, Virginia; and the *Capella* and *Antares* were in Jacksonville, Florida. MSC ordered three of the FSSs to sail on C-Day and the remaining five on C+1. Five were underway after four days, their normal response time. One, the *Regulus*, was one day late responding. The *Denebola*, in overhaul at Bayonne, New Jersey, took nine days to respond. All FSSs, except the *Pollux,* loaded in Savannah, Georgia. The *Pollux* loaded in Wilmington, North Carolina. The *Capella*, departing Savannah on 13 August, was the first FSS to arrive in the AOR, on the 27th. It was followed by the *Altair*, which

departed Savannah, Georgia, on the 14th and arrived in Ad Damman, Saudi Arabia, on the 28th. (Navy Vice Admiral Francis R. Donovan, MSC's Commander, called the first *Capella* and *Altair* voyages "a horse race.") They carried equipment for the 24th Infantry Division (Mechanized) (24th ID). Interestingly, stevedores in Ad Damman unloaded the *Capella* in 12 hours, a record time for an FSS. Learning from the experience, they took only 7 1/2 hours to unload the *Altair* the following day.[10]

All but one FSS, the *Antares*, had finished their first voyage by 7 September. After departing Jacksonville, Florida, on 20 August with 24th ID equipment, the *Antares* began to have boiler problems. As a consequence, she sat dead in the water at approximately 35°-48°N and 68°-55°W on the 25th.[11]

Working with its component commands, USTRANSCOM developed a plan to speed the unit's equipment to the AOR. On the 26th, MSC diverted the *Antares*, under tow by MSC's ocean tug *Apache*, to Rota, Spain. MSC also diverted the *Altair* to Rota to pick up the *Antares*' load and take it to the Persian Gulf. Having completed its first Desert Shield voyage, the *Altair* was in the Mediterranean en route back to the United States for another load. While the two FSSs proceeded to Rota, USCENTCOM, working with USTRANSCOM, identified high priority 24th ID equipment on the *Antares* for airlift from Rota to the AOR.[12]

On 9 September the *Antares* arrived at Rota, followed by the *Altair*. Under the direction of the Commander of MTMC-Europe, Army Colonel Richard J. Barnaby--and with the Military Traffic Management Command (MTMC) Commander Army Major General John R. Piatak and Fast Sealift Squadron ONE Commander Navy Captain Elwood L. Gibson on the scene--98 Army supercargoes from the *Antares* and personnel from US Naval Station Rota began to transfer the *Antares* cargo to the *Altair* on the 10th. The ships were nested port side to, with the *Antares* inboard. Operations included RO/RO to the pier and transloading ship to ship. Transloading was a delicate job involving proper infusion of ballast so that the two ships remained in balance with one another. The ships had to be listed away from each other to keep their deck houses from crashing together. Simultaneously, 50 XVIII Airborne Corps troops, airlifted by the Military Airlift Command (MAC) from Dhahran, Saudi Arabia, to Rota on the 8th, prepared 32 pieces of equipment, including communications vans and generators, for airlift aboard MAC C-5s and C-141s, two of each. All four aircraft had departed Rota by the 11th. Transloading FSS to FSS continued through the 13th with the additional help of 135 troops from Naval Reserve Cargo Handling Battalion Four, who had arrived at Rota from Charleston Air Force Base (AFB), South Carolina, on the 11th aboard two C-141s. The *Altair* departed Rota on the 14th and arrived in Saudi Arabia on the 23d, thus closing the 24th ID three weeks later than planned. For Desert Shield/Desert Storm, the *Antares*' boiler failures proved fatal. Lacking the resources to fix her at Rota,

MSC towed her to Royal Naval Station Gibraltar where she remained throughout the operation under repair by a commercial contractor.[13]

Several points in regard to the *Antares*' failure and the recovery of its cargo need highlighting. Having just completed six months of service in exercise Team Spirit, the *Antares* in August 1990 had been scheduled for major overhaul. Thus USTRANSCOM and MSC accepted a degree of risk in deciding to use her to speed the deployment. Even with a catastrophic failure, the FSS fleet's carrying capacity and speed allowed the remaining seven ships to deliver just over 13 percent of Desert Shield/Desert Storm unit equipment on 32 voyages. (See Table IV-1.) Transloading ship to ship saved time. The entire operation took only 4 1/2 days. Using the normal method of unloading from the first ship onto the dock and then loading the second ship would have taken ten days. Furthermore, the uncommonly difficult operation proved safe. Even with winds of up to 40 knots at pierside, the transload caused no injuries and only minor damage to a UH-60 helicopter when a lashing box broke loose.[14] Overall, and perhaps most importantly, the *Antares* episode serves as an example of USTRANSCOM's value added. In support of USCENTCOM requirements, USTRANSCOM devised a plan to recover the 24th ID cargo and expedite its delivery to the AOR. To do so, the command integrated the three transportation modes--air, sea, and land--and directed the expertise of its three component commands: MAC airlift, MSC sealift, and MTMC port operations.

Ready Reserve Force. While readying FSSs for deployment, USTRANSCOM and MSC turned to the Department of Transportation's Maritime Administration (MARAD) to activate US ships in reserve. (See Appendix 8.) The National Defense Reserve Fleet (NDRF) was comprised of two groups of ships. The Ready Reserve Force (RRF) numbered 96 vessels: 83 dry cargo, 11 tankers and 2 troopships, which were laid up in various states of preparedness allowing them to be ready for sea in 5 days (65 ships assigned), 10 days (28 ships assigned), or 20 days (3 ships assigned). The vessels were administered by MARAD Reserve Fleets: James River, Virginia (38 ships); Beaumont, Texas (35 ships); and Suisun Bay, California (23 ships). Many of the RRF ships were actually located or "out-ported" at various US ports. There were 116 additional vessels in the NDRF, including 71 World War II Victory ships and 45 others ranging in age from 20 to 45 years. Their breakout times ranged from 30 to 90 days. None of the latter group was activated during the operation because of their smaller size, larger crew requirements, older propulsion systems, and slower loading and transit times.[15]

For Desert Shield/Desert Storm, MSC and MARAD undertook the first large-scale activation of the RRF. On 10 August, they activated all 17 of the RRF's RO/RO vessels. (See "Desert Shield/Desert Storm Force Closures," this chapter.) Two of those, the *Cape Henry* and the *Cape Inscription*--carrying the 1st Corps Support Command and the 197th Infantry Brigade--were the first RRF

ships to reach the AOR (9 September). Military commanders preferred RO/ROs for carrying unit equipment because they could be loaded and unloaded quickly: vehicles were driven on and off. During Desert Shield/Desert Storm, RRF RO/ROs were loaded in an average of slightly over three days, while RRF breakbulks averaged five to six days. Also, average RO/RO carrying capacity was greater compared to that of RRF breakbulks: 110,000 square foot vice 40,000 square foot average. Larger ships helped maintain unit integrity.[16] In all, MARAD activated 76 ships during the period 7 August 1990-10 March 1991. Of those, 72 were activated for use in Desert Shield/Desert Storm. Seventy of the 72 were dry cargo ships. A total of 62 RRF ships used in the war effort were common-user dry cargo ships under USTRANSCOM. By war's end, the RRF had carried 28 percent of the unit cargo for US forces (see Table IV-1). MARAD and MSC estimated the average cost per RRF ship to be $1.8M for activation and $3.9M for deactivation. The relatively high average cost for deactivation compared to activation reflected Department of Transportation (DOT) and Department of Defense (DOD) commitment to return ships to the reserve fleet in better shape than they had been prior to the war.[17]

Activation of the RRF was slower than anticipated. Only 20 of the 62 RRF common-user dry cargo ships used in Desert Shield/Desert Storm were activated within their specified time period. Ships scheduled for 5-day breakout took, on the average, 11 days to breakout. It took an average of 16 days to breakout 10-day ships. In nearly every case, MARAD attributed lateness to problems with propulsion or auxiliary machinery. Both DOT and DOD believed the primary cause for such mechanical failures was lack of funds for maintenance and activation exercises. Congress had repeatedly cut RRF funding. In fact, only one third of the RRF ships serving in Desert Shield/Desert Storm had ever been test activated and as a consequence, some of the ships could not meet their advertised readiness levels. MARAD also discovered that some RRF ship contract managers did not have the technical expertise and resources to breakout ships in a crisis. As a result, "in the best interests of the government," MARAD in November canceled reserve ship maintenance, activation, and operating contracts with two RRF ship management companies that had activated ships late. One of those ships, the *Gulf Banker*, had a catastrophic breakdown.[18]

Other ships could not be activated on time because they were laid up far from activation facilities. Maritime Administrator Captain Warren G. Leback noted that five-day RRF ships in Beaumont, Texas, had to be towed to New Orleans, Louisiana, Houston or Galveston, Texas, or Mobile, Alabama, because Beaumont did not have the facilities required to activate them. Towing took up to two days. They also had to undergo a 24-hour sea trial, leaving as little as one day to ready a vessel that might not have been to sea for years. Once activated and brought to operating condition, however, RRF ships performed well. All 17 RO/ROs activated on 10 August completed their first voyage. Overall, the RRF maintained a respectable 93.5 reliability rate.[19]

Commercial Charters: US Flag and Foreign Flag. Along with the prepositioning ships, FSSs, and the RRF, chartered commercial ships played a vital role in the deployment. MSC chartered sealift ships through the release of a worldwide Request for Proposal (RFP). In this way, MSC chartered 32 US flag vessels. The first charter vessel to arrive (9 September) in the AOR (Ad Damman) was the US flag *American Eagle*. It carried 2,864 tons of 101st Airborne Division equipment from Jacksonville, Florida. Overall, the US chartered commercial fleet carried approximately 13 percent of Desert Shield/Desert Storm unit equipment.[20] (See Table IV-1.)

When MSC exhausted US merchant ships offered through RFP, it turned to the allied and friendly sources of shipping. On 18 September, the first foreign charter ship, the Canadian flag ASL *Cygnus*, arrived in the AOR (Ad Damman). It had left Savannah, Georgia, on 25 August carrying 7,363 tons of 24th ID equipment. As of 15 April 1991, MSC had chartered 177 foreign vessels, including 41 RO/ROs, from 34 nations. Cyprus (28), Norway (21), Panama (21), Greece (17), and Bahamas (13) together contributed 100 vessels. (See Table IV-3.) The former Eastern Bloc nations of Poland and Romania contributed five and three ships, respectively. Yugoslavia chartered two vessels to the United States. Twice USTRANSCOM requested, through the Department of State, use of Soviet dry cargo ships and both times the Soviet Union declined. In the first instance, in late August, USTRANSCOM requested to charter the *Magnitagorsk*. The Soviet response through diplomatic channels was that the "*Magnitagorsk* is presently in Leningrad and is preparing to depart for Australia with a load of freight. Generally speaking, the Soviet Union does not plan to be involved in military transport to the crisis area in the Persian Gulf. In this regard, the Soviet Union has given analogous responses to other countries, e.g., Syria, that have made similar requests." Again in December the command raised the issue of Soviet sealift assistance, but the Soviets reiterated their previous position. They considered it "inappropriate to engage in such activities." Germany chartered only four ships. Japan, with a fleet of 2,500 ships including 426 RO/RO (most were car carriers that did not meet unit equipment height and weight requirements) and 439 general cargo, chartered no ships to the United States during the operation.[21] Finally, US allies, including Japan, donated sealift to the war effort, 1,511 sea days worth.[22] (See Table VII-6.) A statistical summary of commercial shipping contributions during Desert Shield/Desert Storm follows. In all, foreign flag vessels carried 26.6 percent of unit equipment, as shown in Table IV-1.[23] Of all dry cargo (unit equipment plus containerized and breakbulk sustainment), the US flag fleet (military and commercial) carried 78.8 percent. Foreign flag vessels carried the remainder, 21.2 percent.[24] (See Table IV-4.)

During Desert Shield/Desert Storm, USTRANSCOM could also have called on commercial ships from the Sealift Readiness Program (SRP). Administered by

MSC, SRP required shipping companies that bid on MSC contracts or received government subsidies to commit 50 percent of their cargo capacity to MSC for possible use during less-than-full mobilization, contingencies, and emergencies. Of the 122 militarily-useful vessels in the program, 23 were tankers and 99 were dry cargo. To activate the program, MSC had to show that (1) the NDRF ships were not available in sufficient time or number to meet requirements and (2) there was insufficient shipping capability at fair and reasonable price to meet requirements or available shipping could not meet requirements. In addition, MARAD had to prepare a report on what impact the activation would have on the commercial charter industry. Approval authority rested with the Secretary of Defense and the Secretary of Transportation.[25]

TABLE IV-3

DESERT SHIELD/DESERT STORM
SEALIFT CHARTERS BY FLAG
(As of 15 April 1991)

COUNTRY	CHARTERS	COUNTRY	CHARTERS
Antigua	1	Panama	21
Bahamas	13	Peru	1
Bangladesh	1	Philippines	4
Bermuda	2	Poland	5
Canada	1	Qatar	1
Cyprus	28	Romania	3
Finland	1	St. Vincent	1
France	1	Saudi Arabia	5
Germany	4	Singapore	7
Greece	17	South Korea	1
Grenada	1	Sweden	1
Honduras	2	Turkey	2
Italy	6	United Arab Emirates	3
Liberia	4	United Kingdom	4
Malta	7	United States	32
Netherlands	2	Vanuatu	3
Netherlands Antilles	1	Yugoslavia	2
Norway	21		
Total Charters	209		

SOURCE: Military Sealift Command (MSC).

For several reasons USTRANSCOM did not use SRP during Desert Shield/Desert Storm. Much of the US maritime industry responded to the contingency voluntarily. By the end of the war, USTRANSCOM had employed

62 SRP-enrolled vessels (8 tankers and 54 dry cargo, including 30 container ships under the Special Middle East Sealift Agreement, as discussed in Chapter V) without even activating the program. USTRANSCOM needed RO/ROs primarily and nearly all of them in the SRP were already supporting Desert Shield/Desert Storm. Furthermore, USTRANSCOM considered the approval process unresponsive to time-sensitive military operations. Finally, activating the remaining RO/ROs and container ships in the SRP could have caused the SRP companies severe and perhaps permanent financial damage by eliminating them from the commercial liner trade.[26]

TABLE IV-4

DESERT SHIELD/DESERT STORM SEALIFT PERCENTAGES FOREIGN FLAG/US FLAG*

(As of 10 March 1991)

	STONS	%
TOTAL DRY CARGO (Unit + Sustainment)	3,048,532	
Foreign Flag	646,315	21.2%
US Flag	2,402,217	78.8%
TOTAL UNIT CARGO	2,431,869	
Foreign Flag	646,315	26.6%
US Flag	1,785,554	73.4%

*US Flag = Fast Sealift Ships, Afloat Prepositioning Force (Prepositioning and Maritime Prepositioning Ships), Ready Reserve Force, US Flag Commercial.

SOURCE: US Transportation Command Situation Reports (SITREPS) and Military Sealift Command (MSC) Lift Summary Reports.

Delivery of Petroleum Products. During Desert Shield/Desert Storm, the United States and its allies required massive amounts of fuel--referred to as petroleum, oil, and lubricants or "POL"--for combat and strategic lift forces. It was MSC's responsibility to move POL and the Defense Fuel Supply Center's duty to procure it. MSC delivered 6.1 million tons of POL in support of the operation: 2.4 million tons in Phase I, 1.4 million tons in Phase II, and 2.3 million tons in Desert Storm.[27]

The size of MSC's tanker force fluctuated depending upon changing POL requirements worldwide. At the beginning of Desert Shield Phase I, the tanker fleet numbered 23: 18 on long-term charter performing peacetime missions worldwide, 4 tankers assigned to the Afloat Prepositioning Force, and 1 small tanker assigned to refueling duties at Bahrain. During August and September, the 23-ship tanker force was sufficient to meet POL requirements with only an occasional spot charter hired to meet increases in demand. In October, MSC added three more tankers to the force to move JP-5 jet fuel from St. Croix, US Virgin Islands, to the US Pacific Command area of responsibility. The force gradually decreased in size until the beginning of the Phase II surge when MSC integrated five Kuwaiti and four RRF tankers into the force. At the outbreak of hostilities on 16 January 1991, the MSC force numbered 43 tankers: 25 moving POL, 11 serving as floating storage vessels in theater (7 for fuel and 4 for water), 6 for refueling support operations, and 1 Offshore Petroleum Discharge System. MSC used 69 tankers--4 RRF, 38 US flag, and 27 foreign flag--at one time or another to support Desert Shield/Desert Storm.[28]

Most of the POL MSC transported during the operation moved intratheater. Seventy-five percent of the shipments delivered to the AOR originated in the Persian Gulf region. Similarly, 70 percent of European deliveries came from European sources, primarily Spain and the Azores, while nearly all of the North American deliveries originated in the United States or the Caribbean.[29]

US Merchant Mariners. Nearly every crewmember assigned to the Afloat Prepositioning Force, Fast Sealift Ships, Ready Reserve Force, and commercial charters were civilian merchant mariners. American merchant mariners fell into two major categories. First, in general, civil service mariners sailed on MSC-owned cargo vessels. Second, US flag charter and RRF ships were crewed for the most part by commercial mariners. Merchant mariners also served aboard MSC hospital ships and auxiliaries such as oilers, combat-stores ships, ocean-going tugs, and aviation logistic support ships.[30]

For Desert Shield/Desert Storm, MARAD needed nearly 4,200 additional commercial mariners to crew the RRF. Who were they? Many who heeded the unions' call were former merchant mariners who came out of retirement. Some of those were veterans of World War II, the Korean War, and the war in Southeast Asia. Nearly 200 cadets from the US Merchant Marine Academy, Kings Point, New York, also served, as did 6 students and 6 professors from Massachusetts Maritime College. Some were raw recruits. The Seafarers International Union expanded its entry-level training program from 60 to 200 students per month to help put bodies on ships fast. The union also increased skill-upgrading courses for firemen and steam engineers from once a quarter to once a month. The Marine Engineers Beneficial Association/National Maritime Union, the Sailors Union of the Pacific, and other maritime unions developed similar programs to expand the pool. Enduring long working hours on multiple

voyages with little or no leave, nearly 9,800 American merchant mariners served during Desert Shield/Desert Storm.[31]

Like their counterparts in wars past, many American merchant mariners in Desert Shield/Desert Storm voluntarily sailed into harm's way. Along with their comrades in uniform, they faced the possibility of floating mines, chemical warfare,* and attacks by Iraqi fighter aircraft and SCUD (surface-to-surface), Exocet, and Silkworm missiles. Why did they volunteer? Although motivations varied, two topped the list: patriotism and money. In praise of merchant mariners' patriotic response, Air Force General Hansford T. Johnson, Commander in Chief, USTRANSCOM (USCINCTRANS), quipped "They showed up in such numbers that we had them draw straws to see who would have the privilege of serving in the Gulf," but in fact there were manning problems. Crew shortages were at least partially responsible for late RRF activations and some ships sailed without their full complement of crewmembers. Two skill groups were in particularly short supply: radio officers and senior engineers who knew how to operate and maintain steam propulsion plants. The task of locating and deploying seafarers for RRF ships on short notice fell to MARAD, Ship Managers, and General Agents. Their job was made more difficult because the activation began on a weekend and continued through the traditional August vacation time.[32] As a result, the Coast Guard was forced to relax certain licensing and training requirements to ensure an adequate supply of mariners for the RRF.[33]

Money was probably the best recruiting incentive. Special wartime compensation included an extra $130 a month, a 10 percent bonus for crews on ammunition ships, and double pay for time spent in the designated combat zones from D-day to cessation of hostilities. Wages ranged from about $4,800 per month for an able-bodied seaman recruit to as high as $150,000 a year for a commercial cargo ship captain. Wartime incentives also included special life insurance coverage and additional bonuses if actually attacked. Fortunately, no merchant mariners lost their lives due to enemy action, although at least one died (from a heart attack) while serving during the operation.[34]

After Desert Shield/Desert Storm, American merchant mariners did not go unrecognized for their service as they had in past wars. They were the only civilians invited to join in the National Victory Parade in Washington, D.C. The Department of Transportation authorized a "US Merchant Marine Expeditionary Medal" for them. MARAD estimated that about 5,000 US merchant mariners who served in the war zone aboard US-flag commercial or government-owned vessels were eligible to receive it. Specifically, they were eligible for the award if they "sailed on [a] US merchant vessel operating in support of US military

*And, like the Desert Shield/Desert Storm US airlift force, the nation's merchant mariners were not prepared for chemical and biological weapon attack. See "Civil Reserve Air Fleet," Chapter III and Rpt (U), JULLS No. 41552-81003 (00127), submitted by MSC, May 92.

forces in Operation Desert Shield/Desert Storm from 2 August 1990 to 31 December 1991 [in] the Persian Gulf, Red Sea, Gulf of Oman, Gulf of Aden, and that portion of the Arabian Sea that lies north of 10 degrees north latitude and west of 68 degrees east longitude."[35] In addition, Congress was considering granting American merchant mariners who served in Desert Shield/Desert Storm reemployment rights similar to those enjoyed by military reservists.[36]

Admiral Donovan took a personal interest in merchant mariner recognition by nominating several ship masters for the Navy's Meritorious Public Service Award based on their "especially noteworthy contributions...made at sea under difficult and often hazardous conditions." At a ceremony conducted in Washington, D.C., on 26 August 1991, the admiral presented the award to Captains Harry J. Bolton (MPS *William R. Button*); James J. Cullen (RRF ship *Cape Inscription*); Deborah D. Dempsey (Lykes' *Lyra*); Robert A. Fay (FSS *Denebola*); John N. Hearn III (RRF ship *Cape Edmont*); Michael B. Miller (RRF ship *Cape Florida*); and Mark R. Sliwoski (FSS *Regulus*). Similarly honored, also on Admiral Donovan's recommendation, were Mr. Hal G. Laws, Maritime Administration representative for Southwest Asia, and Midshipman Steven Buckner, a student at the US Merchant Marine Academy assigned as an engineering cadet to the *Eugene A. Obregon*.[37]

ASSESSMENT

The Decline of the US Merchant Marine and Its Impact on Strategic Deployment. The war in the Persian Gulf heightened USTRANSCOM's concerns for the health of the nation's maritime industry. At the end of World War II, there were thousands of US flag Merchant Marine ships carrying over 50 percent of US foreign ocean-going trade. By 1970, the number of ships in the US Merchant Marine had dropped to 894 with a corresponding decrease in the amount of US trade they carried. The United States, the largest trading nation in the world, carried in 1990 less than four percent of its trade on US flag ships. Due to the high cost of ship building and crewing in the United States compared to other nations, the US shipbuilding and commercial shipping industries were finding it increasingly difficult to compete on the world market.[38] The importance of the issue was recognized at the highest levels. In his 1991 Maritime Day proclamation, President George Bush said the victory in the Persian Gulf "demonstrated, once again, the importance of the American merchant marine to maintaining an adequate and reliable sealift capacity for the United States."[39]

The US Merchant Marine's severe decline had serious ramifications for national security. According to General Johnson, during Desert Shield/Desert Storm "availability and timeliness of unit equipment capable ships from both US and worldwide commercial fleets were not adequate to meet the supported CINC's [Commander in Chief's] surge requirements."[40] To meet the requirement, the

command used virtually every RO/RO it could find: all 17 in the RRF, 47 US flag charter, and 41 foreign flag charter. Competition among the allies exacerbated the problem. For example, in late November, as USTRANSCOM prepared for surge deployment, the United Kingdom was contracting for 22 RO/ROs to move its 4th Mechanized Brigade (Army) to the Persian Gulf.[41] It was during this period that the danger in the situation became most apparent. From late December 1990 to the end of the war, foreign flags carried nearly 40 percent of US unit cargo.[42] (See Table IV-1.) In General Johnson's words, "it worked okay this time but what if foreign governments don't go along with the operation [next time]? After all, only the United Kingdom supported our raid on Qadhafi in 1986. France would not let us fly overhead."[43] In fact there were balkers "this time," in the air and at sea. (See "Allied Support of US Airlift," Chapter III, and "Foreign Flag Balkers," this chapter.)

The situation would only get worse. MARAD predicted that the US Merchant Marine fleet would continue to decline, from 168 militarily useful dry cargo ships in 1990 to 35 by the year 2005. Additionally, commercial trends away from RO/RO and breakbulk vessels in favor of container ships (approximately 70 percent of the commercial fleet was containerized) would reduce further the military utility of the commercial fleet worldwide. For reasons of national security, General Johnson and the regional CINCs believed they should not let the nation continue to increase its reliance on foreign countries for strategic deployment.[44]

Since the Department of Defense could do little, if anything, to improve the US maritime industry's competitive edge and thus deepen the commercial pool of ships from which to draw upon in an emergency, General Johnson and Admiral Donovan sought to strengthen the nation's military sealift force through a balanced program of new ship construction and purchase of existing ships for the RRF. While the maritime industry had converted to diesel-powered ships, most RRF ships still had less efficient and less reliable steam propulsion plants: 83 percent steam, 16 percent diesel, and 1 percent gas turbine. (Although there were casualties among both steam and diesel-powered vessels during Desert Shield/Desert Storm, it was the former type that most often suffered catastrophic breakdowns.) Averaging 24 years old, RRF ships were predominantly breakbulk freighters and tankers, types that USTRANSCOM passed over during the war for ones more militarily useful. Consequently, General Johnson proposed adding 21 diesel-powered RO/ROs to the RRF between Fiscal Year 1992 and Fiscal Year 1995. Purchased on the world market with MARAD appropriated funds, they should have a minimum carrying capacity of 100,000 square feet each and be able to sustain a speed of between 19 and 23 knots. They should also be placed in reduced operating status in clusters of three or four and located at ports as near as possible to where they would be needed.[45] MARAD wanted to assign each cluster a skeleton crew that would maintain the ships and take them out on regular sea trials. Furthermore, Deputy Maritime Administrator Robert E.

Martinez planned to stiffen contracting requirements for RRF ships maintenance, activations, and operations. In the future, MARAD would award RRF management contracts "only to firms that can prove their capabilities."[46]

General Johnson supported MARAD's RRF readiness proposals and recommended to the Chairman, the Joint Chiefs of Staff (CJCS), and to the Chief of Naval Operations (CNO) other ways to increase RRF reliability during the activation period. In addition to frequent sea trials, USCINCTRANS proposed performing dock trials every 12 to 18 months. Training--partial onloads, familiarization tours, and JCS exercises--needed to include terminal personnel and be "coordinated with unions to ensure availability of trained mariners." USCINCTRANS also wanted to assure adequate spares inventory for RRF ships, designate groups of RRF ships to deploy critical units, and establish liaisons between deploying units and nucleus crews. The DOD and DOT needed to "formalize policy on required readiness and establish required days of readiness based on deploying units readiness, earliest arrival date (EAD) and latest arrival date (LAD)." Perhaps most importantly, they needed "funds budgeted to support improved readiness and reliability."[47]

As part of RRF modernization, General Johnson recommended scrapping the NDRF's World War II-vintage ships. Their military worth was extremely doubtful and their very existence provided a false sense of security. Besides, based on USTRANSCOM's Desert Shield/Desert Storm experiences, it was unlikely crews could be found to man them. (See "US Merchant Mariners," this chapter.) Finally, funds used to maintain them would be much better spent on upgrading the RRF. The General Accounting Office (GAO) estimated that scrapping the obsolete ships in the NDRF would save about $10 million in direct maintenance costs over the next decade and generate between $38 to $42 million to improve the RRF if ships were sold to the highest foreign or domestic bidders. Most importantly, MARAD needed Congress to guarantee adequate funding to modernize the RRF.[48] "You cannot maintain a Ready Reserve Force on a year-to-year basis without knowing how much money you're going to have over time," emphasized Maritime Administrator Captain Leback.[49]

General Johnson also wanted to improve communications with and tracking of RRF and other merchant ships. According to USCINCTRANS, two actions were required: "(1) provide secure rapid communications system and install/remove from ships as they come on/off hire; and (2) transmit ship positions to Joint Visual Integrated Display System (JVIDS). Transmission and data entries should be automatic." Consequently, he recommended "procurement of 250 secure communications sets and 250 satellite positioning systems."[50]

In addition to modernizing the RRF, General Johnson and Admiral Donovan wanted to increase the number of RO/RO ships in the MSC fleet. Specifically, USCINCTRANS recommended building ten strategic sealift ships in US

shipyards with US Navy funds. With diesel power and a sustained cruising speed of 25 knots, they should have a carrying capacity of 200,000 square feet. Although USCINCTRANS sought a balance between buying and building ships, he emphasized the necessity of buying ships immediately to fill the sealift surge shortfall. The *Saudi Abha* should serve as the example. A Saudi flag RO/RO with clean lines, easy access, and 202,000 square-foot carrying capacity, the *Saudi Abha* performed superbly for transporting unit equipment during Desert Shield/Desert Storm.[51]

General Johnson and Admiral Donovan had considerable support. Ranking "Sealift Roll-On/Roll-Off Ships" number three on his list of 80 highest priority programs for funding, the Commander in Chief, United States Central Command (USCINCCENT), told the Chairman, Joint Chiefs of Staff, "we do not have sufficient sealift to meet our most critical warfighting requirements and with the continuing decline in maritime assets, even less will be available to meet future needs. To reverse this trend," he continued, "all elements of the strategic sealift program need to be addressed. Our objective," he concluded, "should be the pursuit of a dynamic national sealift policy, encompassing both DOD and the Maritime Administration."[52]

The thoughts of Army General Edwin H. Burba, Jr., Commander in Chief, Forces Command (FORSCOM), echoed those of USCINCCENT and USCINCTRANS. Also ranking "Strategic Sealift" near the top of his funding priorities list, he told the Chairman, Joint Chiefs of Staff, that "current strategic sealift capabilities represent a significant shortfall that must be addressed before the Army can attain required mobility standards." He recommended that sealift modernization "focus on surge sealift consisting of fast, strategic lift ships to move initial armored divisions, and medium speed vessels to meet requirements for theater reserve stocks and prepositioned afloat stocks."[53*]

Although afloat prepositioning was ultimately the services' responsibility, USTRANSCOM obviously had to consider it in the planning process. In general, prepositioning reduced the sealift requirement but, as General Johnson emphasized, there was more to the equation. Prepositioning placed a large demand on airlift. Plans for deployment of a Marine Expeditionary Brigade required 250 sorties, 30 of which had to be C-5, 35 of which could be Civil Reserve Air Fleet, and the remainder should be military (C-141, C-5, or C-17). The number of missions could, of course, change depending on the types of aircraft actually used. For example, during Desert Shield/Desert Storm, MAC

*Admiral Donovan agreed and added that "among [Desert Shield/Desert Storm] lessons learned must be the flaws in general appreciation for transportation principles. The need for educating the services on 'how' to use TRANSCOM's assets is as deserving of our attention as is the study of future mobility requirements. One without the other will present the same impediments in any future contingency operation." (SOURCE: Msg (SECRET Downgraded to Unclassified), COMSC to USTRANSCOM, Personal for VADM Butcher Info MGEN Piatak from Donovan, 282306Z Feb 91.)

required 264 C-141-equivalent airlift missions to deploy the 7th Marine Expeditionary Brigade to Saudi Arabia to unite with Maritime Prepositioning Squadron-2. Only a small portion of those flights carried troops. Even Army divisions scheduled to deploy to the European theater, with its huge prepositioned stocks, planned on substantial use of military airlift. A typical mechanized infantry division deploying to Europe would need a minimum of 69 C-5 and 221 C-141 cargo missions to supplement its very sizable commercial lift requirement. Simply put, military aircraft were required to carry equipment and armament--such as helicopters, aircraft engines, test equipment, and communications vans--that could not fit on commercial aircraft and, because of cost, security threats, or sensitivity to the elements, could not be prepositioned, a fact the unified CINCs would need to take into account during deliberate planning. Most importantly, Desert Shield/Desert Storm had validated the Afloat Prepositioning Force concept. As a result, General Johnson intended to back services' plans to expand the program. (See "Afloat Prepositioning Force: Prepositioning Ships and Maritime Prepositioning Ships," this chapter.)[54]

There was a related issue of great concern to USTRANSCOM. Fewer ships meant fewer jobs for merchant mariners and, as a consequence, manpower had dwindled almost 60 percent since 1970 to a current level of about 10,000. MARAD projected that it would be less than half that amount by the turn of the century. In 1990, the average age of a US merchant seaman was 49 years old, which meant many of the mariners who manned the RRF ships during Desert Shield/Desert Storm were in their 60s and 70s. At least two were in their 80s. The oldest was 92. There were teenagers as well.[55]

Although no RRF ship activated for Desert Shield/Desert Storm failed to sail because of crew shortage, demographics portended big problems in the next war. Secretary of Transportation Samuel K. Skinner warned that during Desert Shield/Desert Storm the DOD activated less than half of the emergency sealift force and it had nearly exhausted the nation's supply of merchant mariners. MARAD predicted that by the year 2000 the nation would be short 1,600 seamen to man the Ready Reserve Force, Fast Sealift Ships, and commercial vessels during initial surge deployment. The shortage would increase, MARAD estimated, to more than 7,200 during sustainment operations. Additionally, according to MARAD, the Department of Defense's "phased activation of ready reserve force vessels mitigated difficulties in repairing vessels and obtaining crews." In other words, a full mobilization with total RRF activation (including the tankers, of which only two of eleven were used for operations in the oil rich Persian Gulf) likely would have depleted the mariner pool. MARAD also believed that, based on its conversations with military reservists, "many former mariners who wanted to assist in crewing RRF ships were deterred from leaving their shoreside jobs because of their lack of reemployment rights."[56]

One possible solution would be to recall to active duty members of the Naval Reserve Merchant Marine Reserve Program. The program's 3,000 US Naval Reserve (USNR) officers, all currently licensed merchant mariners, were trained to operate merchant ships serving as Naval auxiliaries and perform shoreside duties in support of sealift readiness. Most of the cadre were recent graduates of US maritime colleges and held lower level licenses. Many also held Master/Chief Engineer licenses qualifying them to fill senior officer billets in the RRF. The program, however, had its drawbacks. The US Navy was legally prohibited from manning RRF ships with its active duty or reserve forces (50 USC 1744). Industry and labor would likely resist such a move, considering the reservists to be in competition for jobs. Furthermore, the Merchant Marine Reserve Program would not address the need for unlicensed seamen, which was greater than the one for licensed officers.[57]

Establishment of a Merchant Marine Reserve--similar to the Naval Reserve, but operated by MARAD and consisting of civilian merchant seamen with a contractual obligation to MARAD--would be another possible solution to the forecasted shortfall. For example, using the DOD/Maritime Academy relationship as a model, the program would subsidize students at state maritime colleges in return for a medium-to-long-term service obligation upon graduation. A MARAD-contracted study estimated such an arrangement would add 500 officers to the pool annually at a cost of less than $6 million. MARAD also considered forming an organization like the USNR with members assigned to units with monthly drills and two weeks of active duty per year. This arrangement might include an annual salary, prevailing wages while on duty, government health benefits, and guaranteed reemployment after active service.[58] General Johnson applauded MARAD's efforts to ensure an ample supply of mariners, but emphasized that any such program should provide incentives for long term commitment and ensure fully manned RRF crews for initial surge operations. A Merchant Marine Reserve should not, he added, compete with the active mariner labor pool.[59]

Commercial Industry's View and USTRANSCOM's Response. Based on their Desert Shield/Desert Storm experiences, commercial carrier companies offered several suggestions to improve strategic deployment. All called for increased use of containerization (see "Containerization," Chapter VI). Most wanted to play a bigger role in military exercises and planning. For instance, Crowley Maritime Corporation's President and Chief Executive Officer (CEO), Leo L. Collar, suggested that USTRANSCOM arrange for mid-level executives from the domestic and international liner, tanker, and dry-bulk operators to meet with military planners for a one- or two-week exercise each year. Specifically, he wanted USTRANSCOM to include more of the industry in Joint Logistics Over-the-Shore (JLOTS) exercises. USTRANSCOM intended to make that happen.[60]

USTRANSCOM and commercial transporters recommended that the military increase its use of seasheds and flatracks to improve the nation's ability to move unit cargo. Through the Sealift Enhancement Program, the Department of Defense constructed these large, metal cage-like pieces of equipment to adapt container ships or container sections of combination carriers (breakbulk/container, roll-on/roll-off container) for carrying a variety of vehicles and other heavy military cargo. During Desert Shield/Desert Storm, MTMC used about 1,230 of its 2,010 flatracks. At Military Ocean Terminal, Bayonne, New Jersey, they allowed MTMC to load a container ship with wheeled cargo and helicopters that otherwise would have had to wait for the arrival of a breakbulk or roll-on/roll-off vessel.[61]

MSC adapted two vessels, the RRF crane ship *Flickertail State* and the US flag charter breakbulk ship *Mallory Lykes*, with seasheds for the operation. Together they used only 19 of the Navy's 890 seasheds. (Each Fast Sealift Ship held 13 seasheds. As part of the ships, they were not purchased under the enhancement program.) USTRANSCOM did not use more seasheds during the initial Desert Shield surge because RO/ROs were available to carry unit cargo and it did not want to take the time to make the container ship adaptations. As the deployment developed later on, the command chose not to expand seashed use for a combination of reasons, including rapidly changing requirements, type of ships available, and the location of ships and seasheds. USTRANSCOM agreed with industry* that it should increase its emphasis on sealift enhancements and would do so beginning with redeployment from the Persian Gulf.[62]

Some commercial carriers wanted greater compensation for their sacrifices in future emergencies. For example, Mr. Leo Collar stated that MSC's charter of *American Falcon* and *American Condor* for Desert Shield/Desert Storm "required the total discontinuation of [Crowley's] European service." As a result, the company had to terminate many of its employees and all of its agents. Mr. Collar doubted that Crowley could ever again make a profit on that route. He concluded that "compensation for carriers whose vessels were taken out of the commercial market was inadequate to make up for the inconvenience, loss of credibility in commercial markets, and the jobs that were lost in the private sector."[63] Mr. Wallace T. Sansone, MSC's Deputy Commander, saw it differently. He argued that the government had adequately compensated the carriers for their actions in Desert Shield/Desert Storm. He also pointed out that Crowley had been losing money on its European service prior to the deployment to the Persian Gulf.[64]

John Clancey, President and CEO, Sea-Land Service; Jim Amos, CEO, Lykes Lines; and George Hayashi, President, American President Lines, called for MSC to revise its emergency sealift contracting procedures. Mr. Hayashi noted that no

*American President Lines wanted to carry light-wheeled vehicles such as light trucks and high mobility multi-purpose wheeled vehicles in flatracks.

military freight moved by liner vessel for nearly a month following Iraq's invasion of Kuwait, despite the fact that the liner sector and the military commenced contract negotiations in early August. "Had a crisis-environment procurement and bidding process been in place to enable the liner sector to begin moving the freight immediately, while specific contract language was concurrently finalized," he argued, "this lengthy, costly bidding period could have been avoided, available assets immediately utilized, and the needs of the military more economically met." To help remedy the problem, he recommended that MSC develop a contingency response program, like those at Military Traffic Management Command and Military Airlift Command, covering commercial operators. More importantly, he believed, MSC needed an "off-the-shelf, pre-negotiated rate and cargo distribution system" to facilitate commercial liner support in the next war. Industry, put succinctly, argued that price competition slowed response time and thus hurt the Department of Defense.[65]

Admiral Donovan strongly disagreed. Dismissing the carriers' rationale and conclusion as "a case of revisionist history and veracity in an attempt to build a case for shifting contracting responsibility," MSC's Commander presented his views on the issue to General Johnson:

> Absolutely no cargo was delayed due to any contracting or fiscal issues....In fact, there were no actual requirements to move large volumes of container cargo during the early surge phase of Operation Desert Shield. In addition, if necessary, MSC has the ability to use letter contracts to meet emergency lift requirements....Our first meeting [with the carriers] to commence negotiations for the agreement [to transport containerized sustainment cargo] took place on 11 Aug 90 after the initial surge lift force was organized 7 to 10 August. The entire process took 13 days and was completely in place before any sustainment cargo was even offered for shipment. In fact, much of the 13 days were spent in trying to determine the requirement as accurately as possible for the carriers. Even though the agreement was in place in August, the sustainment cargo pipeline did not start to flow until early November. It is testimony to the skill, knowledge, and foresight of the negotiators that an agreement was drafted which ultimately [had the flexibility] to accommodate our expanding requirement.[66]

The admiral feared that contract rate reform, as envisioned by the carriers, would eliminate price competition in favor of cost-based rates to the detriment of DOD.

On the issue of contract rates, General Johnson accepted his rightful role as facilitator. Seeking to end the long-standing adversarial relationship between the carriers and MSC, he advocated a "fresh look" at contracting. Applying Total Quality Management (TQM) principles and "business-like" methods, he sought to

build a "partnership between government and industry." Specifically, he wanted government and industry, using the National Defense Transportation Association's Sealift Committee as the forum, to evaluate a Civil Reserve Air Fleet-like contracting approach where rates were constructed from carrier costs. Finally, if USTRANSCOM had peacetime authorities over the Transportation Component Commands (TCCs), it could expedite paradigm change and create new ways of doing business.[67]

Foreign Flag Balkers. Although crews on foreign flag ships supporting the US deployment to the Persian Gulf on the whole proved dependable, USTRANSCOM's Desert Shield/Desert Storm sealift experiences clearly illustrate the risks associated with them. For a variety of reasons--political, religious, pay disputes and, most commonly, fear of entering a combat zone--crews on at least 13 foreign flag ships* carrying US cargo hesitated or refused to enter the area of operations. Of the balkers, three were foreign manned feeder vessels operating for US flag ship companies under MSC's sustainment arrangement, the Special Middle East Sealift Agreement (SMESA) (see Chapter V). The US flag firms transloaded the cargo from two of the foreign flag feeder vessels to their own ships and the crew on the third foreign flag feeder vessel decided to continue the voyage, but only after the US Navy provided an escort. Consequently, SMESA cargo from all three of these foreign flag feeder vessels arrived in the area of operations as scheduled.[68]

In January and February 1991, crews on six foreign flag ships carrying US cargo expressed strong reservations about entering the war zone. USTRANSCOM, working with USCENTCOM and MSC, quickly convinced the foreign crews that it was safe to proceed. Those ships, all of which arrived at Saudi ports as planned, were the *Hirado Maru* (Japan), *Jade Bay* (Greece), *Ciudad de Manta* (Greece), *Stena Trailer* (Bermuda), *Trident Baltic* (United Arab Emirates), and *Samsun Honor* (Republic of Korea). In the case of the Bangladesh flag *Banglar Mamata*, the commands' persuasive efforts failed to sway the Moslem crew and officers: most of them jumped ship in Oakland, California, as the vessel prepared to take on DOD cargo. As a result, MSC canceled its contract with the ship's operator on 31 January.[69]

USTRANSCOM determined it lost a total of 34 ship transit days due to delays on the other three foreign flag balkers that carried cargo for US troops. At the request of USCENTCOM and USTRANSCOM, the American Embassy in Tokyo reached an agreement on 24 January with the Japan Seaman's Union, which on 16 January had passed a resolution preventing Japanese ships from operating in the Persian Gulf west of longitude 52 degrees east, allowing the *Key Splendor* to proceed to Ad Damman. Carrying 3,205 tons of Air Force matting, it arrived at the Saudi port on 5 February, two days later than planned. On 19 January, crew

*There likely were others that did not come to USTRANSCOM's attention.

members on the Bahamian flag ship *McCoral*, loaded with 2,625 tons of combat service support cargo, refused to proceed from Muscat, in southeast Arabia on the Gulf of Oman, to the war zone. After swapping out the ship's master and five crew members, the ship's operator was finally able to get the vessel underway. It arrived at Ad Damman on 2 February, 13 days later than planned.[70]

One foreign flag ship under contract to MSC did not complete its voyage. The Qatari flag* *Trident Dusk*, carrying 2,371 tons of combat support and combat service support equipment to Saudi Arabia, refused to enter the combat zone, even when offered a Navy escort. As a result, MSC arranged transfer of the ship's cargo and equipment to the Panamanian flag *Canadian Forest* at Muscat. That load arrived at Ad Damman on 7 February, 19 days later than planned.[71]

In summary, foreign flag ships crews were, overall, reliable during Desert Shield/Desert Storm. Balkers this time had no impact on the war's outcome and slowed US force closures only minimally, if at all. Still, the hesitation and refusal of some foreign flag crews to complete their voyages to the Persian Gulf raises the question of foreign flag shipping dependability in future conflicts, especially when the United States acts unilaterally or without the broad-based, worldwide support it experienced during Desert Shield/Desert Storm. Furthermore, in the next conflict, unlike Desert Shield/Desert Storm, there might be a credible maritime threat,** which could possibly cause foreign crews to balk in large numbers. *Only* the United States is *not* a signatory to the International Transport Workers Federation Seafarers Section Resolution on War Zones. Adopted in Venice, Italy, in 1986, and reaffirmed and endorsed by the Joint Maritime Commission of the International Labour Organization in Geneva, Switzerland, that same year, the resolution gave foreign seamen the right to decline to enter a war zone.[72]***

Desert Shield/Desert Storm Force Closures. The United States Transportation Command and its component commands did not meet US Central Command's (USCENTCOM's) force closure date of 15 January 1991: they could not recover from a late deployment start. At the end of October, USTRANSCOM and MSC began prepositioning ships returning from the Persian Gulf near ports in the United States, northern Europe, and the Mediterranean in anticipation of initiating a 76-day operation beginning 1 November, as planned.[73] The Joint Chiefs of Staff, however, could not issue the deployment order until the

*There was confusion as to who actually owned and operated the *Trident Dusk*, which complicated DOD efforts to get the ship back underway.

**Iraq's navy was neutralized and the mine threat was minimized. No commercial ships were lost due to enemy action.

***Patriotism and special wartime remuneration, rather than any lack of legal protection, explain why US merchant mariners did not balk at entering the war zone (see "US Merchant Mariners," this chapter).

President announced, on 7 November, his intentions to the American public. That order came on the 8th.[74]

Slower than planned equipment movements to the ports increased the delays, especially in Europe where units had no deployment mission. They were, in fact, deployed themselves.[75] MSC had a total of 22 ships lined up at seaports of embarkation when loading finally got underway in earnest, following Thanksgiving in the United States and the first week of December in Europe.[76] General Johnson had to become personally involved to break the log jam by making "phone calls on 1 December 1990 to four-star level in the continental United States and Europe to accelerate port calls."[77] At the major European ports during Phase II, cargo was not available for loading when a ship arrived 70 percent of the time. In comparison, in Phase I cargo was available for loading when a ship arrived in a US port 70 percent of the time.[78]

As a result of the late start and port call delays, the commands were unable to use ships on hand for multiple voyages. On 25 November, Military Sealift Command warned USTRANSCOM that the relatively few ships that loaded and sailed since the President's decision had decreased the command's chances of making some second voyages "with highly productive RRF, charter, and control RO/ROs."[79] USTRANSCOM was especially displeased over losing the opportunity "to use 17 large and fast RO/RO vessels for second and third shuttles to the Persian Gulf."[80]

Exceptionally bad weather aggravated the problem. During the last week of December a severe storm in Europe delayed departure of 18 ships carrying the 1st, 2d, and 3d Armored Divisions' equipment. On the 28th, weather closed the ports of Bremerhaven, Germany, and Antwerp, Belgium, denying access to 12 ships waiting to enter. Ports in the United States were affected as well. Fog shut down the port of Houston, Texas, for two days and freezing rain slowed ship loading along the Atlantic seaboard in late December.[81]

Storms also slowed progress of ships en route to the Persian Gulf. On 5 January the Commander in Chief, US European Command, reported 30-foot seas along the eastern Atlantic sea lanes. USTRANSCOM estimated that due to high seas in the Atlantic and English Channel overall transit times were 15 to 25 percent slower than planned.[82] Also, stevedore operation slowdowns at ports in Europe over Christmas and New Year's Day caused minor slippages as did the lack of ammunition ship sheathing.[83]

More importantly, sealift requirements ballooned during the surge deployment for Desert Storm. Unit equipment requirements nearly doubled, from 8.0 million square feet, as validated by USCENTCOM on 11 November, to 15.0 million square feet by 15 December. Other emerging requirements included force modernization equipment, deployable medical units, and heavy equipment transporters (HETs).[84] A 1,500 percent increase in ammunition requirements

was especially troublesome: the need for blocking, bracing, and sheathing resulted in an average load time for ammunition ships of nine days (and often much longer) compared to a two-day average for RO/ROs.[85]

Changing requirements complicated and thus slowed the deployment. Initially, USCENTCOM wanted support units, specifically, engineers and transportation experts, to deploy first to establish an intheater infrastructure for arrival of combat units, the second deployment priority. By 21 November, about the time units started shipping out, USCENTCOM issued new priorities: unit equipment (support and combat), modernization of forces, and ammunition resupply, in descending order. At the end of December, HETs were first on USCENTCOM's list, followed by transportation units, combat units, force modernization, and ammunition. USCENTCOM considered the HETs of such critical importance that it told USTRANSCOM, if necessary, to hold ships in port until the equipment transporters arrived dockside.[86] As a result, the *Capella* was delayed two days at Jacksonville, Florida, from 22 January to 24 January, in order to load HETs along with combat support unit cargo.[87]

To compensate for delays and lift shortfalls, USTRANSCOM and MTMC maximized shiploads even if it sometimes meant splitting a unit's equipment among two or more ships.[88] Additionally, MSC and USTRANSCOM activated additional Ready Reserve Force ships and chartered foreign flag ships, but in both cases the vessels were less capable and less reliable than desired. The RRF ships, nearly all breakbulk, took, on the average, three times longer to breakout of the reserve than did those called to duty for the surge deployment in August. Three of the RRF ships broke down and turned back. As stated earlier (see "The Decline of the US Merchant Marine and Its Impact on Strategic Deployment," this chapter), the commands competed with the British, French, and other Europeans on the open market for a limited number of RO/RO ships and, as a result, they were forced to charter more breakbulk and fewer and smaller RO/RO ships than they had requested.[89] (See Table IV-5.) The cumulative effect of late deployment starts, bad weather, burgeoning and changing requirements, and RO/RO ship shortages was that the cargo and equipment of six combat units--1st Infantry Division (1st ID), 5th Marine Expeditionary Brigade (5th MEB), 2d Marine Aviation Wing (2d MAW), and 1st, 2d, and 3d Armored Divisions (1st, 2d, and 3d ADs) arrived after 15 January. (See Table II-1 and Appendix 2.) Nearly all of their cargo arrived by the 26th. The 2d AD, 1st AD, 1st ID, and 3d AD closed on 17, 21, 26 January, and 7 February, respectively. Although the last ships carrying cargo and equipment for the 5th MEB and 2d MAW did not arrive until 19 and 22 February, those units considered themselves combat ready by 15 January. Fortunately, the late arrivals had little, if any, effect on the war's outcome and, interestingly, the amount of cargo USTRANSCOM delivered by sea as of 15 January, 9.1 million square feet, exceeded the original requirement of 8.0 million square feet by 12 percent.[90]

TABLE IV-5

CARGO PROFILE: LAST THREE SHIPS*

JOLLY SMERALDO (Italy)

TYPE OF VESSEL:	Small RO/RO
CARGO:	Equipment from 30 units 16 - 3 AD 3 - VII Corps units 2 - 1 AD 2 - 5th Signal CMD units 7 - other units
EXAMPLES OF EQUIPMENT:	50 M1A1 tanks from 4 3AD Armor Bns 13 BFV systems from 2 3AD units 33 helicopters: 10 Apache, 11 utility, and 3 CW from 3 3AD units; 8 CH 47s from V Corps 46 HET tractors with trailers

MANGALIA (Romania)

TYPE OF VESSEL:	Small RO/RO
CARGO:	Equipment from 15 units 10 - 3AD units 5 - other units
EXAMPLES OF EQUIPMENT:	63 M1A1 tanks from 3 3AD Armor Bns 92 BFV systems from 8 3AD Armor/Infantry units 20 fuel trucks/trailers from 3 3AD units

MARINA C (Cyprus)

TYPE OF VESSEL:	Small Breakbulk
CARGO:	Equipment from 42 units 17 - 3AD units 2 - 32d AADCOM units 2 - 5th Signal CMD units 9 - VII Corps units 12 - other units
EXAMPLES OF EQUIPMENT:	80 trucks/trailers from 17 3AD units 56 trucks, trailers, MKTs, generators from 2 - 32d AADCOM units

*These three shiploads approximate one FSS.

NOTE: Army Division (AD); Battalions (Bns); Heavy Equipment Transporter (HET); Army Air Defense Command (AADCOM); Mobile Kitchen Trailer (MKT); Chemical Warfare (CW).

SOURCE: Brfg Summary (U), Joint Logistics Board Meeting Summary, Operation Desert Shield/Storm: Logistics Meets the Challenge, 22-23 May 91, USEUCOM.

Following the war, General Johnson offered his analysis of the situation:

> Looking back, we would have been better off to have had a phased closure date, with some people closing earlier.* [In that way] we could have done it with the shipping on hand. But as it was, each unit looked at 15 January and based their departure planning on meeting that date.[91]

Consequently, USTRANSCOM lost nearly a month's worth of move time, which it was unable to make up.

Although the delay in ship arrivals eased ship queuing at seaports of debarkation just prior to the coalition offensive, it indirectly contributed to troop overcrowding intheater. For most of the deployment, USCENTCOM allowed USTRANSCOM to deliver troops by air to the theater of operations within a five-to-seven day window around the arrival of their equipment by sea. As they approached the 15 January deadline, USCINCCENT and his supporting CINCs became increasingly concerned about airlift's capability to close passengers on time.[92] On 28 November, USTRANSCOM's Director of Operations and Logistics, Air Force Major General Walter Kross, told the Joint Staff "each day we do not maximize onload capability increases possibility of December congestion at SPOEs [seaports of embarkation] and January queuing and congestion at SPODs [seaports of debarkation]. As overall Phase II sealift flow compresses," he continued, "MAC will be severely taxed to deliver passengers to coincide to the arrival of unit equipment by sea."[93]

Passenger requirements were rising so quickly over the next few weeks--for example, by 16,343 (from 208,600 to 224,943) in five days (8 to 13 December)--General Johnson informed the Chairman, Joint Chiefs of Staff, Army General Colin L. Powell, that USTRANSCOM would have a "shortfall of 1,200 passengers per day during the period 15 Dec 90 to 15 Jan 91...each passing day without moving maximum amounts of cargo and personnel is a missed opportunity in closing the force by 15 Jan 91."[94] Consequently, in mid-December, the Joint Chiefs of Staff and the CINCs agreed to "push" passengers to the Persian Gulf: deploy troops when they were ready even if it meant that they would arrive intheater outside the standard timeframe. To accommodate the influx, USCENTCOM designated King Fahd, King Khalid Military City, and Al

*In fact, on 13 November 1990, his Director of Operations and Logistics at USTRANSCOM, Air Force Major General Walter Kross had asked USCENTCOM to "consider one important variation to Phase II deployments. Move and on-load at ports the equipment of major units that are ready to move, but sequence their delivery intheater as per USCENTCOM priorities. This action would reduce the pressure on European intheater transit and on pending SPOD [seaport of debarkation] workload by starting sealift on-load a little earlier." (SOURCE: Msg (SECRET Downgraded to Unclassified), USCINCTRANS/TCJ3/J4 to USCINCCENT/CCJ3/J4, et al., Desert Shield Phase II Force Movements, 130404Z Nov 90.)

Jubayl, as well as Riyadh, Saudi Arabia, aerial ports of debarkation, leaving Dhahran primarily for cargo offloading (see Table II-5).[95]

According to the 1st Infantry Division (Forward), which was the VII Corps' controlling headquarters in Saudi Arabia for debarkation and deployment intheater, "pushing" passengers meant:

> the airflow and seaflow were badly out of synchronization by the end of December....For example, the 3d AD on 6 January had 80 percent of its soldiers but only 30 percent of its equipment. The 1st AD on 1 January had 80 percent of its soldiers and only 40 percent of its equipment on the ground....The results were long delays [for troops] in the reception area awaiting equipment, over-crowding, lost training opportunities, and unnecessary risk to soldiers.[96]

As recorded by the 1st ID, a breakdown of unit integrity, due at least in part to USTRANSCOM's policy of maximizing ship loads (see Table IV-5), contributed to the problems at reception facilities. The division's analysis of 19 randomly selected combat arms and combat support battalions showed that, on average, a battalion's equipment arrived on seven vessels over a period of 26 days. On average, combat service support battalions came into port on 17 vessels over a period of 37 days. Without their equipment, units could not move forward and make room for newly arriving troops.[97]

The 1st ID asked, in its review of the operation, why USTRANSCOM had not turned down the airflow to put it back in synchronization with the sealift. In response, General Johnson replied:

> VII Corps was pushing very, very hard to move the troops. And we moved them! Looking back, we all could have made different decisions. But at the time, we were using available resources, and we used them to the very best of our ability. No matter what anybody might say in after action reports, it was an incredible feat to move the VII Corps as quickly as we did.[98]

One final point needs to be made in regard to closure of Desert Shield/Desert Storm forces: the "incredible feat," as General Johnson referred to it, was exacerbated by USTRANSCOM's lack of maturity as a fully operational, peacetime as well as wartime, unified command. As the deployment unfolded, according to Air Force Major General Malcolm B. Armstrong, Special Assistant to the Director of the Joint Staff, USTRANSCOM's component commands, much out of habit, consulted extensively with their parent services and the other unified commands "to the exclusion of USTRANSCOM [which] had an adverse impact on the deployment" by limiting Joint Staff and supported CINC visibility over it. Poor communication up the joint chain of command could also create the

perception of strategic lift mismanagement. For example, on 19 February 1991, MSC activated three RRF tankers without USTRANSCOM's knowledge and, as a result, General Johnson had misinformed Congress as to the status of activations. General Armstrong's conclusion and recommendation to his superiors on the Joint Staff: to break peacetime transportation procedural habits in the DOD, and to smooth the transition to war, USCINCTRANS required "full-time operational command of his components." In the case of RRF, USCINCTRANS would seek, through the Office of the Secretary of Defense, activation authority in peace and war.[99*] General Johnson also recommended that USCINCTRANS gain, vis-à-vis the services, greater authority over strategic mobility industrial funds. Admiral Donovan, for one, considered the unresponsiveness of his service's comptroller to funding RRF activations during Desert Shield/Desert Storm to be the strongest argument for centralizing DOD transportation operating funds under USCINCTRANS in peace and war.[100]

*On 9 August 1990, the Secretary of Defense authorized RRF activations and on the 10th the Secretary of the Navy (SECNAV) requested that the Maritime Administrator and the Commander, MSC, begin activating the reserve's RO/ROs under the DOD and Department of Transportation Memorandum of Agreement of 30 October 1988. SECNAV sent USCINCTRANS a copy of the request. In essence, USCINCTRANS had to obtain the Navy's permission to activate RRF vessels. (See also "Ready Reserve Force," this chapter.)

***Prepositioning Ship* Austral Rainbow**

CHAPTER IV NOTES

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5. MSC SITREPS; File (S-DECL OADR), "Afloat Prepositioning Force"; History (U), MSC/CAPT Harold S. Tiernan, SC, USNR, Draft History of MSC During Operation Desert Shield/Desert Storm, 16 Jul 91, (hereafter cited as Tiernan History); Article (U), *Proceedings Naval Review*, Brig Gen Edwin H. Simmons, USMC (Ret.), "Getting Marines To the Gulf," 1991, pp. 50-64; Article (U), *Proceedings Naval Review*, CAPT Douglas M. Norton, USN, "Sealift: Keystone of Support," 1991, pp. 42-49; Article (U), *Leatherneck*, Charles E. Browning, "MPS - Maritime Prepositioning Ships," Jul 91, pp. 26-29; Point Paper (U), TCJ3/J4-LLD/G, Maritime Prepositioning Force (MPF), 4 Oct 91; Citation (U), Secretary of the Navy to I Marine Expeditionary Force, Navy Unit Commendation Citation, 14 Aug 90 to 16 Apr 91.

6. See note above.

7. Ibid.

8. Fact Sheet (U), MSC Public Affairs, Public Affairs Guidance and Fact Sheet for Fast Sealift Ships, 9 Aug 90; Msg (U), Secretary of Defense DPL to TCDC, et al., Public Affairs Guidance: Deployment of Fast Sealift Ships (FSS) to Southwest Asia, 110257Z Aug 90; Point Paper (U), TCJ3/J4-LP, Fast Sealift Ships (FSS), 14 Mar 90, w/atch: Generic Unit Lift Requirements (U); Point Paper (U), TCJ3/J4-LP, Fast Sealift Ships (FSS) Breakout History, 11 Sep 90, w/atch: FSS Exercise Participation History (U), 25 May 90; Info Paper (U), JS/J4-LRC, Fast Sealift Ships, 16 Sep 90.

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Major General John R. Piatak, USA
Commander, Military Traffic Management Command
September 1989-September 1991

CHAPTER V

OVERLAND TRANSPORTATION AND PORT OPERATIONS

OVERVIEW

An integral part of the Desert Shield/Desert Storm transportation effort was the marshaling of combat forces with their heavy equipment. The United States Transportation Command's (USTRANSCOM's) Army component command, Military Traffic Management Command (MTMC), coordinated the movement of Army, Air Force, and Marine Corps units to seaports, prepared those ports for ships and cargo, and supervised the loading operations at ports worldwide. As outlined in Appendix 9, MTMC and Military Sealift Command (MSC), USTRANSCOM's Navy component command, recorded the loading of about 2.70 million tons of equipment and dry cargo onto 537 ships at 50 commercial and military ports worldwide in support of Desert Shield/Desert Storm.[1]

MTMC also worked behind-the-scenes with industry and government agencies to keep the combat units moving. On 8 August 1990, for the first time, MTMC initiated the Contingency Response (CORE) Program. With representatives from MTMC, Department of Transportation (DOT), and industry, CORE coordinated exemptions and waivers, and handled safety, security, facility, and transportation resource issues. Designed to facilitate volunteer cooperation between government and industry, CORE could also be directive. However, it soon became apparent that there would be adequate landlift for the operation. Therefore, MTMC deactivated the formal CORE organization on 16 October 1990, although the program continued throughout the operation to serve informally as the command's conduit to industry. For example, when the United States Central Command (USCENTCOM) identified a shortfall of Heavy Equipment Transporters (HETs), MTMC coordinated the effort to locate the vehicles in the civilian sector and move them to the ports for shipment to the United States Central Command's area of responsibility (AOR).[2]

OPERATIONS

US Ports. Ports in the United States loaded 1.7 million tons of equipment and dry cargo on 330 ships, as shown in Appendix 9. In the United States, the Port of Jacksonville, Florida, loaded the most ships (59) and the second most cargo (220,653 tons). Those figures represented 17.9 percent of the total ships and 13.1 percent of the unit cargo that embarked US ports in support of Desert Shield/Desert Storm. The second leading US port for number of ships loaded was Houston, Texas. Forty ships carrying 213,648 tons departed from Houston for the Persian Gulf, which represented 12.1 percent and 12.7 percent of the total ships and total cargo loaded at US ports. MTMC's terminal at Military Ocean Terminal, Sunny Point (MOTSU), North Carolina, loaded the most cargo

(375,892 tons), nearly all of it ammunition, on 38 ships. Those figures represented 22.3 percent of the cargo and 11.5 percent of the ships loaded in the United States. Two other US ports loaded ammunition ships: Earle, New Jersey (two ships and 11,701 tons), and Concord, California (nine ships and 68,361 tons).[3]

To help maintain unit integrity, MTMC moved each major combat unit through a single port whenever possible. For instance, Jacksonville loaded the 101st Airborne Division and Savannah, Georgia, loaded the 24th Infantry Division (Mechanized) and the 197th Infantry Brigade. The 4th Marine Expeditionary Brigade moved through MOTSU, while the XVIII Airborne Corps Artillery departed from Charleston, South Carolina, and Wilmington, North Carolina. On the Gulf Coast, Beaumont, Texas, loaded the 3d Armored Cavalry Regiment and Houston, Texas, loaded the 1st Infantry Division, 13th Corps Support Command, and 1st Cavalry Division. On the West Coast the I Marine Expeditionary Force embarked from Long Beach, California.[4]

As discussed in "Total Force Integration," Chapter VII, MTMC depended greatly on its reservists to open and run ports during Desert Shield/Desert Storm. At the outset of the operation, MTMC had 1,841 Army reservists assigned to 27 units: 3 Deployment Control Units (DCUs); 3 Port Security Detachments (PSDs); and 18 Transportation Terminal Units (TTUs) to assist ship loading at seaports of embarkation (SPOEs). MTMC also had in its reserve force 2 Cargo Documentation Detachments and 1 Railway Services Unit.[5]

The DCUs ensured that equipment was configured properly, documented, labeled, and in conformity with shipping standards. Operating from its home state at Baton Rouge, Louisiana, the 1190th DCU, one of the first MTMC reserve units called to active duty, sent teams out to deploying units at 18 military bases in 15 states from Massachusetts to Arizona. The 1394th DCU, Camp Pendleton, California, supported units deploying from West Coast ports. The third DCU, the 1179th from Brooklyn, New York, was not called to active duty for the operation.[6]

Providing physical security to military ports during loading operations, the PSDs were the 1302d, Orangeburg, New York; the 4249th, Pocahontas, Iowa; and the 6632d, Los Alamitos, California. The 1302d and 4249th were called to active duty early in the operation. The former served at Houston, Jacksonville, Savannah, and Bayonne, New Jersey, while the latter supported at Wilmington and MOTSU. Called up later, the 6632d also supported MOTSU and Military Ocean Terminal Bay Area (Oakland, California).[7]

As shown in Table V-1, TTUs during Desert Shield/Desert Storm resided along US coasts near the military seaport terminals they were designated to support. Each TTU was assigned 75 military personnel (28 officers and 47

enlisted) to prepare loading plans, conduct manifesting, contract for longshoremen, and stage equipment for loading. In general, TTUs managed the loading of ships at military terminals during the war.[8]

TABLE V-1

ARMY RESERVE TRANSPORTATION TERMINAL UNITS

Unit	Home Station	Initial Volunteers?	Used While Training?	Called Up?	Ports Served
1169th TTU	Boston, MA	No	No	No	--
1170th TTU	Boston, MA	No	No	No	--
1172d TTU	Boston, MA	No	No	No	--
1173d TTU	Boston, MA	No	Yes	No	Savannah, GA
1174th TTU	Fort Totten, NY	Yes	Yes	No	Newport News, VA
1175th TTU	Pedricktown, NY	Yes	No	No	Jacksonville, FL Wilmington, NC
1176th TTU	Baltimore, MD	Yes	No	Yes	Bayonne, NJ Wilmington, NC Charleston, SC
1181st TTU	Meridian, MS	Yes	No	Yes	Jacksonville, FL Antwerp, BEL
1182d TTU	Charleston, SC	Yes	Yes	No	Bremerhaven, NETH
1184th TTU	Mobile, AL	Yes	Yes	No	Beaumont, TX Houston, TX Jacksonville, FL
1185th TTU	Lancaster, PA	No	Yes	Yes	Newport News, VA Bayonne, NJ MOTSU, NC Savannah, GA Wilmington, NC Rotterdam, NETH
1186th TTU	Tampa, FL	Yes	No	Yes	Rotterdam, NETH
1188th TTU	Kings Point, GA	No	No	No	--
1189th TTU	Charleston, SC	Yes	Yes	No	Charleston, SC
1191st TTU	New Orleans, LA	Yes	No	Yes	Beaumont, TX Houston, TX
1192d TTU	New Orleans, LA	Yes	No	Yes	Beaumont, TX
1395th TTU	Seattle, WA	No	Yes	No	West Coast Ports
1397th TTU	Seattle, WA	No	Yes	No	West Coast Ports

SOURCE: Study (U), ANDRULIS Research Corp., John R. Brinkerhoff, "The United States Army Reserve in Operation Desert Storm: Port Operations," 3 May 91.

Working side by side with TTUs, the International Longshoremen's Association (ILA), whose members say ILA stands for "I Love America," responded immediately to the crisis. Many of the ILA's stevedores traveled to where they were most needed at their own expense. Work went on nonstop: 12-hour shifts,

24 hours a day, seven days a week. During surge operations, it was not uncommon for stevedores to work 24 or more hours straight with only four or five hours off before starting up again. They loaded ships in 100-plus degree heat on Labor Day and in snow and ice on Christmas. To guarantee that its members were able to meet the military's demands, ILA leadership set up and conducted training courses in forklift operation, steam winchmanship, and ammunition handling and loading. Army Major General John R. Piatak, MTMC's Commanding General, called the ILA's members Desert Shield/Desert Storm's "unsung heroes."[9]

US Overland Transportation. As with port operations, MTMC relied heavily on the commercial sector for overland transportation. For instance, Landstar Systems, one of MTMC's largest truck charter companies, shipped 400 truckloads of 101st Airborne Division gear from Fort Campbell, Kentucky, to the Port of Jacksonville, Florida, 780 miles away in 3 1/2 days. In all, MTMC used 27 commercial trucking firms in 1,174 truckloads to move the 101st to Jacksonville. For Desert Shield/Desert Storm, MTMC routed 1.2 million tons of unit cargo and equipment to US seaports on nearly 16,000 commercial rail cars and 54,000 commercial trucks. (MTMC estimated that it loaded 945,000 vehicles and other pieces of unit equipment on ships departing from US ports.) In addition, MTMC estimated that commercial truck companies carried 70 percent of all Desert Shield/Desert Storm ammunition. Overall, the commercial sector accounted for nearly 90 percent of the tonnage transported by truck and rail to US ports. MTMC's Defense Freight Railway Interchange Fleet of 1,421 heavy-duty flatcars carried the remainder, mostly heavy fighting vehicles such as M1 and M60 tanks. Because the command did not own or operate passenger transport vehicles, nearly all of the troops arrived at their continental US embarkation points via commercial aircraft or commercial bus (about 105,000 troops by the former and 30,000 troops by the latter) under contract to MTMC.[10]

The US rail, truck, and bus industries responded patriotically to the Desert Shield/Desert Storm mobilization and deployment. Burlington Northern Railroad created a train service dedicated to military cargo. The company moved 1,500 carloads of food, ammunition, jet fuel, and other military impedimenta. Conrail moved 474 carloads of M1 tanks from manufacturing facilities to the port at Bayonne, New Jersey. It also transported 276 carloads of new "Hummer" utility vehicles and 1,209 carloads of new five-ton trucks from the production line to air and seaports of embarkation. Santa Fe and Union Pacific moved 3,851 and 2,000 carloads respectively in support of Desert Shield/Desert Storm.[11]

The Association of American Railroads recorded that, in descending order, CSX Transportation, Union Pacific, Southern Pacific Transportation Co., and Atchison, Topeka and Santa Fe Railway were the major haulers of military equipment during the deployment to the Persian Gulf. By war's end, CSX Transportation estimated it had moved 13,000 carloads of unit equipment and

general cargo. It also estimated that it operated 1,500 trains dedicated to the military between August 1990 and the end of February 1991. Conrail, Santa Fe, Union Pacific, and Norfolk Southern willingly supplemented CSX Transportation's fleet with cars of their own. The industry moved empty cars with the same urgency as loads. Additionally, railroad companies accepted thousands of interchanged cars during the deployment. A key CSX rail corridor for interchange traffic ran from East Saint Louis, Illinois, through Evansville, Indiana, and Memphis and Nashville, Tennessee, to the CSX Transportation Hamlet Railyard near Lumberton, North Carolina.[12]

With the nation's largest bus company on strike and virtually out of the military charter business, MTMC turned to the National Motorcoach Network (NMN) to move troops over land. A consortium of 30 companies with 1,500 motorcoaches nationwide, NMN, participating in its first large mobilization and deployment, positioned relief drivers on interstate highways around the country. Motorcoach carriers were responsible for arranging meal stops for the troops. (The association noted that it intended to reward, with postwar business, eating establishments that accepted military meal vouchers.) In addition to cross-country transport of troops, NMN buses provided the military with short hauls. For example, they shuttled thousands of troops to the National Training Center, Fort Irwin, California, from local airports.[13]

Deployment from Europe. Only a handful of ships left European ports for the Persian Gulf during the first Desert Shield surge. (See Appendix 10.) The largest single unit deployment was the Army's 12th Combat Aviation Brigade. Between 8 and 14 September, its cargo and equipment deployed on four ships, three from Livorno, Italy, carrying 9,065 tons, and one from Rotterdam, Netherlands, carrying 1,102 tons.[14]

European and other overseas ports were extremely active during the Desert Shield surge deployment from mid-November 1990 through early March 1991, as depicted in Appendices 9 and 10. Throughout Desert Shield/Desert Storm, ports overseas loaded 207 ships with 1,003,036 tons, much of it in support of the Army's VII Corps during the Phase II surge. Overseas, Bremerhaven, Germany, ranked number one, with 268,883 tons on 48 ships. That represented 23.2 percent and 26.8 percent, respectively, of the total tonnage and ships embarking from foreign ports to the AOR. Rotterdam ranked number two with 41 ships carrying 151,140 tons. Ranking third was Antwerp, Belgium, loading 32 ships with 103,463 tons. Under the supervision of MTMC-Europe Commander Army Colonel Richard J. Barnaby, MTMC TTUs on temporary duty from the United States operated military terminals at ports in Europe, as follows: 1181st, Antwerp; 1185th and 1186th, Rotterdam; and 1182d, Bremerhaven. The 1190th DCU provided documentation support throughout the European theater from its deployed base at Stuttgart, Germany.[15]

Transporting the VII Corps' nearly 40,000 pieces of equipment and 24,000 tons of ammunition to four embarkation ports in only 42 days was a herculean task. For the deployment, US Army Europe, along with the 1st Theater Army Movement Control Agency and MTMC-Europe, decided to maximize the use of rail and barge transport. Truck convoying would be a last resort because of dangerous winter driving conditions. They also decided to use "train equivalents" as the measurement standard for movement of the Corps. Their formula equated the Corps' unit equipment, cargo, and ammunition into a number of trains. Similar formulas converted barge and convoy loads into "train equivalents." They estimated it would take 585 "train equivalents" to move the Corps to the ports. Finally, they estimated, based on a 20-day sailing time, that the force would have to be at the ports by 20 December 1990 in order for it to close in the Persian Gulf by 15 January 1991 as required.[16]

Except for a greater reliance on convoys than originally envisioned, the VII Corps deployed as planned. Units moved by truck and rail from their stations to MTMC-Europe's Rhine River Terminal at Mannheim, Germany, located 250 miles inland where the Neckar River joins the Rhine. There MTMC offloaded the vehicles and equipment and then loaded them onto barges. The barges proceeded down the Rhine on a three-day trip to Antwerp, Belgium, or Rotterdam, Netherlands, for another offloading and loading, this time on ships embarking for the Persian Gulf. MTMC moved 15,000 pieces of equipment on 520 barge loads to Rotterdam and Antwerp. Overall, MTMC estimated that barges moved between 35 percent and 40 percent of all cargo transported to European ports in support of Desert Shield/Desert Storm. Most of the heavy-tracked equipment traveled by rail to Bremerhaven. The commander of MTMC's Bremerhaven Terminal estimated that it took about 10,000 rail cars and 9,000 trucks to move 3,600 tracked vehicles and 14,000 wheeled vehicles to Bremerhaven. To meet the deployment schedule, Army transporters in Europe relied on trucks to convoy (73 unit convoys by US European Command's [USEUCOM's] count) about 20 percent of the Corps' equipment. They also contracted 50 commercial buses to move the Corps' troops on 2,000 bus shuttles to aerial ports for deployment to the US Central Command area of responsibility. From the second week in December through mid-January, between 2,000 and 3,500 soldiers flew out of Germany daily. The VII Corps marked its port closure at 5:45 PM, 20 December, when the last military truck in the final convoy of the 2d Armored Division (Forward) arrived at Bremerhaven. The final "train equivalent" count was 590. USEUCOM tallied a total of 46,099 pieces of equipment loaded at European ports for the Phase II deployment.[17]

Host government support was the key to the success of the deployment from Europe. Foreign nationals--military, civil servants, and contractors--worked side-by-side with US transporters. The Dutch, for example, loaned the US Army trucks and drivers. Government officials in Germany, the Netherlands, and Italy made available to US forces berths and marshaling areas at their ports. Their

assistance was invaluable in complying with international agreements and local and national regulations. The deployment of the 12th Combat Aviation Brigade from Wiesbaden, Germany, through France to Livorno, Italy, for example, required, on short notice, rail and customs clearances as well as overflight rights from the three countries. Host nations also granted waivers to US forces for the transport of ammunition and other hazardous cargo over land and by barge. Additionally, host nations provided most of the security for ports, convoys, and rail yards.[18]

ASSESSMENT

Peacetime Operations, Exercises, and Planning. As with Desert Shield/Desert Storm airlift and sealift, study of overland and port operations prompts some observations. For instance, peacetime operations and exercises paid dividends during the deployment. Since 1987 MTMC had used commercial ports in its annual Reforger* exercises. Port authorities and civilian and military stevedores in the United States termed Reforgers "dress rehearsals." In Europe, transporters dubbed the Desert Shield/Desert Storm deployment "Deforger," a Reforger in reverse. In early 1990, they also gained considerable experience moving some 2,200 tanks, armored personnel carriers, and howitzers out of Europe under the Conventional Forces Europe Treaty. CSX Transportation valued its regular, long term relationship with the military: repeated and exhaustive drills "52 weeks a year" had prepared it for the deployment, according to the company's Assistant Vice President for Sales, Joe DiCarlo. He added that CSX Transportation especially valued as "realistic rehearsals" its periodic ammunition movements from Charleston, South Carolina, to Blount Island, Florida. The commercial industry's leadership--truck, rail, and ports--was unanimous in calling for the military to increase their participation in exercises, both live and simulated.[19]

Leaders in the commercial transport business also wanted to be included in mobilization and deployment planning. According to Lillian C. Liburdi, Director, Port Department, Port Authority of New York and New Jersey, only then could they "intelligently address [the military's] facilities, space, and labor requirements." Benny Holland, President, South Atlantic and Gulf Coast District-International Longshoremen, agreed. "Early identification of highly active ports will help us put the manpower where it is needed," he emphasized. CSX Transportation criticized "short lead times" and "inflated requirements," which greatly complicated its ability to allocate scarce resources. Similarly, James A. Hagan, Chairman, President, and Chief Executive Officer (CEO), Consolidated Rail Corporation, believed that the railroads' lack of information concerning military intentions early in the deployment hindered their ability to respond. He especially wanted the military to more clearly identify installations where rail would be required for mobilization and deployment so industry and

*Return of Forces to Germany--an exercise in deploying troops from the United States to Germany.

government could more wisely invest funds in rail track and loading dock maintenance. Trucking industry spokesman, Jeffrey C. Crowe, President, Chairman, and CEO, Landstar Systems, Incorporated, helped increase his trucking company's responsiveness by creating a 24-hour hotline for the military.[20]

Reliability, Safety, and Labor. Truck and rail companies in the United States coped with shortages and met deployment requirements through cooperation with their competitors and the military, but, in the words of Dick Davidson, President and CEO, Union Pacific Railroad, for the rail industry "it was a close fit." For example, during Desert Shield/Desert Storm, CSX Transportation, with the largest inventory of cars in the railroad industry, pressed into service for the military boxcars usually reserved for paper customers. CSX Transportation reported that military-type cars, such as 50-foot boxcars and 60-foot and 89-foot flatcars, were especially hard to find. At war's end, the situation sent CSX Transportation's Bill Braman, Manager for Distribution, Car Management, Baltimore, "begging for cars" in preparation for troops scheduled to return through Blount Island.[21]

Union Pacific's Davidson predicted greater problems in the future. With the drawdown of military forces in the post-Cold War era, there would be fewer exercises to test mobilization. As a consequence, he argued, there would be less incentive for commercial rail companies to maintain in their inventories low revenue-producing cars and other equipment specially constructed for the military. "If we don't need to provide rail equipment for training exercises," Mr. Davidson stated, "there's a good chance shortages will develop if and when the next conflict begins." He added that, had the economy been stronger, the rail industry might not have been able to meet the military's requirements during Desert Shield/Desert Storm. Davidson's points were not lost on the military establishment. To help ensure that USTRANSCOM would be able to move unit equipment to the ports in the future, Air Force General Hansford T. Johnson, Commander in Chief, USTRANSCOM (USCINCTRANS), would seek funding to expand MTMC's Defense Freight Railway Interchange Fleet.[22]

Army mobilization centers across the United States often faced the same challenges. They commonly reported missing vehicle shackles, bad chain angles, loose and twisted chains, and unsecured blocks on rail cars. Inadequate manpower for around-the-clock operations was a frequently registered irritant,[23] but there were also much more serious problems: deteriorating rail facilities at several locations constrained the Desert Shield/Desert Storm deployment. Water on the tracks at Fort Bliss, Texas, forced trains carrying equipment for the operation to run, at times, at reduced speeds to avoid derailment. Similarly, standing water around the tracks in the holding yard at MOTSU attracted alligators from the nearby swamp. At times railway workers dismounting locomotives were chased by the reptiles. When the 101st Airborne Division,

Fort Campbell, Kentucky, received deployment orders in August 1990, the installation's transportation officer informed the unit's commander that the Department of Defense (DOD)-owned and -operated branch line to the commercial line at Hopkinsville 22 miles away would likely fail (it did on redeployment, when there were eight derailments) and recommended against using it. Sections of rail, dated at the turn of the century, were too light for mobilization loads. Several bridges were in disrepair and many cross ties were rotten. As a result, the commander used commercial trucks to transport the division's tracked and heavy vehicles 750 miles to Jacksonville, Florida, the port of embarkation, or to loading sites for transfer to rail. Often this meant the trucks traveled on public highways up to twice the distance permitted under Army policy. Also to avoid using the Fort Campbell line, the commander moved nearly all of the division's lighter vehicles via convoy to Hopkinsville for loading on rail cars.[24]

There was a similar story at Fort Stewart, Georgia, where DOD-owned and -operated tracks were in such poor condition, due to years of deferred maintenance and neglect, that trains carrying equipment to Savannah, Georgia, for the 24th Infantry Division (Mechanized), were restricted to ten miles per hour or less. Even at such slow speeds the heavily loaded trains continued to damage the track forcing the facility to close the line for emergency repairs between October 1990 and February 1991. Consequently, National Guard units deploying from Fort Stewart to the National Training Center in support of Desert Shield/Desert Storm had to move their heavy equipment by highway to off-post commercial rail facilities for transfer to rail cars.[25]

Deteriorating rail facilities at mobilization stations have been a long-standing problem for the Department of Defense. In 1986, the Army designated Forces Command (FORSCOM) as its executive agent for managing rail facility repair and rehabilitation. Through its Rail Maintenance Program, the command planned to spend about $140 million on such projects through 1994. Redirection of funds, changing guidance, and disagreements between the government and contractors over responsibilities and engineering designs delayed action and increased estimated costs. By the end of the war, track repair projects had been started at only four of the 31 mobilization stations targeted for work and of those four only one (Fort Carson, Colorado) had been completed. In the post-war period, USTRANSCOM would need to take an active role in assessing the readiness of the fort-to-port leg of strategic mobility and ensuring adequate funding and proper management of improvement programs.[26]

Although rail traffic was slowed at several locations because of unsafe track conditions, no ships were delayed due to rail car or track reliability. In fact, of the approximately 16,000 rail cars used in the United States to deliver Desert Shield/Desert Storm unit equipment and cargo, less than two dozen required en route repairs. In its movement of about 54,000 truckloads of unit equipment and

cargo, the commercial trucking industry suffered only one serious accident (a truck caught fire in Nevada). Landstar System's Crowe believed that luck had been on the trucking industry's side. In many instances, trucks had to take detours, particularly with oversize cargo, because bridges were out or unsafe. "Our national transportation infrastructure, particularly our roads and bridges, are in a deplorable state," Mr. Crowe noted in his post-Desert Shield/Desert Storm analysis. Thomas J. Donahue, President and CEO, American Trucking Association, noted that shipments were delayed early in the deployment "by states enforcing strict limits on trucks with dromedary boxes used to keep fuses separate from munitions." In future contingencies, stressed Mr. Donahue, the Department of Defense and the trucking industry should immediately petition the Department of Transportation "to lift pertinent truck size and weight restrictions."[27]

Military port operators registered several safety concerns. On occasion, pallets of ammunition arriving at MOTSU were not blocked and braced. Longshoremen found ammunition containers that had not been strapped to pallets and compressed gas cylinders unrestrained in vehicles. Consequently, they had to reload and reconfigure cargo, which slowed deployment. Such carelessness also posed unnecessary safety risks to the crowded ports. To avoid accidents and speed operations, General Piatak emphasized the need for deploying units to complete packaging of unit equipment at home station.[28] He also told his area commanders that on visits to MTMC ports and terminals he had "observed blatant disregard of basic safety requirements such as inadequate lifting gear, absence of tag lines, and improperly dressed [contract] labor." He wanted them to increase their "on site vigilance" making spot safety inspections and ensuring that contract laborers "meet the same safety standards that apply to our soldiers and DA [Department of the Army] civilians."[29]

For the most part, US commercial ports accommodated military ships without delay during the deployment, but port authorities foresaw problems in the future. Port Authority spokesperson Ms. Liburdi was especially concerned that the government and industry find ways to dispose of materials dredged from the nation's waterways. Without an active, innovative, and cooperative effort in this matter, dredging operations might be curtailed. Channels would begin to fill, thus obstructing access to the nation's ports. In fact, MSC reported that ship draft limitations at MOTSU prevented MTMC from fully loading ammunition ships embarking for the Persian Gulf. Port authorities also solicited Department of Defense and Department of Transportation backing in their negotiations with local communities over land use. Balancing community needs with those of the military--such as marshaling areas and road and rail access to ports--was, port authorities believed, an issue of increasing importance to national security. Perhaps of most importance, port authorities and military commanders alike theorized that, had the economy been stronger and imports up during Desert Shield/Desert Storm, military ships would have had to compete with commercial

ships for labor and berths, which in turn would have delayed the deployment. As a result, General Johnson told Congress the nation's ports needed additional berthing "to accommodate an increase in surge sealift assets and ensure a smooth flow for rapidly deploying heavy units."[30]

General Johnson was also concerned over the lack of a modern ammunition loading facility on the West Coast of the United States. Current ammunition outloading capability failed to meet wartime requirements and as a result USTRANSCOM and MTMC, in coordination with the Army and Navy, would seek funding to build a common-user ammunition container facility at Naval Weapons Station, Concord, California. Under the proposal, MTMC would operate the terminal. It should have at least the same loading capability as MOTSU, 600 twenty-foot-equivalent containers per day.[31]

Initially, there were labor shortages at the seaports of embarkation. Prior to Desert Shield/Desert Storm, the International Longshoremen's Association (ILA) had been decreasing its membership in the Atlantic, South Atlantic, and Gulf ports due to a weak economy and a general decline in military business. Because of their proximity to Camp Lejeune and Fort Bragg, North Carolina, their ammunition-loading capability, and their reliance on the same stevedore pool, the South Carolina Port of Charleston and the North Carolina Ports of Morehead City, Wilmington, and MOTSU, were a particular concern to DOD. On 7 August 1990, the area had about 300 laborers. To meet the military's requirement, ILA needed nearly 600 stevedores. For the initial August surge, the Association helped make up the difference by recruiting 175 laborers from Galveston, Texas, Philadelphia, Pennsylvania, and other ports to load ships along the North Carolina and South Carolina coasts. During surge operations in early February 1991, ships began to backup at Wilmington and MOTSU due in part to shortages of stevedores skilled in forklift operations. Again ILA volunteers from around the country, about 80 of them, broke the logjam. Based on his Desert Shield/Desert Storm experiences, ILA's Hagan considered organizing and training a "mobile longshoremen's force" for future contingencies.[32]

MTMC experienced its most serious labor-related problem the second week of September when a shortage of stevedores caused the MTMC Eastern Area Commander Army Brigadier General Hubert G. Smith to close the port of Wilmington. At the beginning of the month, the ILA's most experienced members working at Wilmington were drawn to MOTSU due to a workload increase and higher wages for handling hazardous cargo at the ammunition-loading terminal. To augment the remaining, less experienced stevedore force at Wilmington, according to General Smith, "the ILA began hiring laborers who had never loaded a ship." As a result, General Piatak requested and received within 24 hours about 100 military stevedores from the 7th Transportation Group, Fort Eustis, Virginia. They performed the extremely arduous task of blocking and bracing LASH (Lighter Aboard Ship) ships (*Cape Farewell* and

Cape Flattery), to carry 1st Corps Support Command rolling stock, before receiving orders to deploy to the AOR with their unit. With the Army's stevedore capability concentrating intheater, General Smith sought additional ILA support to maintain high-operational tempo at both Wilmington and MOTSU, but again found the work force not up to the task: "the ILA was dipping into the bottom of the labor pool. The local union representative was sending people to Wilmington who weren't trained and experienced stevedores. We just couldn't tolerate this, so we closed the operation at the port" and diverted to Charleston unit equipment and ships scheduled for loadout at Wilmington. In late November and early December, the balancing of workload between the two North Carolina ports allowed MTMC Eastern Area to resume operations at Wilmington and thus facilitate the deployment of the II Marine Expeditionary Force stationed at nearby Camp Lejeune and Cherry Point.[33]

There might have been severe labor shortages in the rail industry. On 15 February, the nation's major rail companies and unions, representing nearly a quarter of a million workers, faced a contract deadline. At issue was a three-year-old dispute over wages, health care costs, and work rules. To avoid a strike or lockout while the United States was at war (even if the President acted quickly to seize the rail systems, there would have been a disruption in service), they agreed on 13 February to a 60-day extension of contract talks. United Transportation Union president Fred Hardin's position on the issue reflected that held by most of the rail industry's workers and management. He stated he and his 100,000 followers were "Americans first and workers second." The new deadline would be 17 April. Similarly, ILA workers, "in the nation's best interests," continued to work throughout Desert Shield/Desert Storm even though their contract had expired in October. ILA workers did strike at Baltimore in January, but with minimal impact on the deployment.[34]

Military Traffic Management Command in Europe. Moving forces over land and loading them on ships in Europe differed greatly from such operations in the United States. While it operated military port terminals in Europe much as it did in the United States, MTMC did not control inland truck and rail traffic functions in Europe. Instead, the 1st Theater Army Movement Control Agency, which reported to US Army Europe, managed those transportation assets. Lack of a traffic single-manager in Europe complicated the Desert Shield/Desert Storm deployment as did the need to comply with the laws and regulations of foreign nations. For example, a convoy carrying large amounts of explosives and other hazardous materials over crowded roads often required a wide variety of permits from several countries. However, as discussed earlier, host nations worked hard to facilitate the deployment.[35]

Requiring multiple loading and unloading, barge operations in Europe appeared cumbersome, but in reality they greatly facilitated and expedited inland transport. Barge traffic decreased rail and road congestion and permitted

simultaneous movement by different modes. More importantly, from MTMC's perspective, barges increased the command's ability to expedite the deployment because MTMC managed that portion of the inland traffic system. Overall, barges speeded deployment by increasing the availability of truck and rail assets to move cargo and equipment to Bremerhaven and other ports not serviced by inland waterways. Even so, MTMC estimated that in December 1990, the German rail industry was short 5,000 cars. A shortfall in ammunition-certified rail cars forced the 1st Theater Army Movement Control Agency to delay transport of Air Force ammunition in favor of the VII Corps deployment. Without barges, the delays likely would have been worse.[36]

USCINCTRANS' Conclusion. In a letter to Ronald W. Drucker, Senior Vice President and Chief Executive Officer, CSX Corporation, General Johnson summarized his thoughts on Desert Shield/Desert Storm surface transportation activity in the United States. He believed that the nation's ability to rapidly deploy forces was "absolutely dependent upon" MTMC's relationship with commercial industry. "We must all continue to work to keep that relationship strong," he emphasized. He underscored the importance of a healthy surface transportation industry for surge capacity. He added that as the United States reduced its overseas military presence, the nation's dependence on commercial industry for surge operations would increase. He also stressed that military and commercial transporters needed to "press for improved maintenance and expansion of the nation's transportation infrastructure, particularly in the areas of highways, intermodal connections, and bridges of all types." General Johnson concluded that, overall, surface transportation support to Desert Shield/Desert Storm was "an unqualified success for both military and commercial industry participants." He was "continually impressed by the seemingly effortless talent and professionalism displayed across the entire spectrum of the Department of Defense-Commercial Surface Transportation Industry team as they overcame every obstacle in the path of deploying our nation's forces."[37]

CHAPTER V NOTES

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CHAPTER VI

CONTAINERIZATION

OVERVIEW

Containers, referred to in the transportation business as "boxes," come in a wide variety of sizes and serve a multitude of purposes. During Desert Shield/Desert Storm, the US military most commonly used 20-foot (20'x8'x8') and 40-foot (40'x8'x8') containers, the former for ammunition and the latter for resupply cargo, such as rations, clothing, and spare parts. The larger boxes also carried small vehicles, unit basic loads, like tents, packaged petroleum products, and building and barrier materiel. Container advantages are many, but of most importance is their "intermodal" capability: they easily move from one mode of transportation to another, for instance from a truck, to a train, to a barge, to a ship and then, upon arrival overseas, back to a truck, a train, or a barge. For several reasons, as discussed below, the Department of Defense (DOD) has been slow to adopt containerization even though the US commercial industry, upon which DOD relies for most of its deployment capability, has converted almost entirely to the method.

SPECIAL MIDDLE EAST SEALIFT AGREEMENT

During Desert Shield/Desert Storm, Military Sealift Command (MSC) contracted with US shipping companies to transport DOD cargo aboard regularly scheduled United States-Middle East liner services. Through this contracting arrangement, the Special Middle East Sealift Agreement (SMESA), the United States Transportation Command (USTRANSCOM) capitalized on the container ship strength of the US maritime industry to deliver almost all of the Desert Shield/Desert Storm sustainment cargo. Several US liner services participated: American President Lines, Central Gulf Lines, Farrell, Lykes, Sea-Land Service, and Waterman, among others. Military Traffic Management Command (MTMC) estimated that it booked, and MSC shipped, about 37,000 40-foot SMESA containers to the Persian Gulf during the operation. Under SMESA, the liners also carried some breakbulk and a small number of 20-foot and refrigerated containers. The two largest SMESA carriers, American President Lines and Sea-Land, transported about 80 percent of the SMESA cargo, just over 40 percent and just under 40 percent, respectively.[1]

The military's first large-scale use of containers, SMESA was both flexible and reliable. Awarded on 23 August 1990, the contract called for a 10-week-long service, beginning on the 27th, with a government option for extensions. (SMESA was still in effect when redeployment began on 10 March 1991.) A capability of 2,700 40-foot containers per week was planned although the weekly deliveries varied from as low as 250 early in the deployment to over 3,300 in

mid-February 1991. (See Table VI-1.) Rates ranged from $7,000 to $8,000 per 40-foot container, based on the number hauled per week. US flag SMESA carriers sailed almost daily on their established routes to transshipment points where they transferred their SMESA cargo to smaller, foreign flag feeder vessels under charter to them. The foreign flag ships then shuttled the SMESA cargo to the United States Central Command (USCENTCOM) area of responsibility (AOR). Departures from New York City, New York; Norfolk, Virginia; and Charleston, South Carolina, transshipped at Algeciras, Spain, or Alexandria, Egypt, for shuttle to Jeddah and Ad Damman, Saudi Arabia. Likewise, sailings from Oakland/San Francisco, California; Seattle/Tacoma, Washington; and Long Beach/San Pedro, California, transloaded at Singapore or Al Fujayrah, United Arab Emirates, for transfer to Ad Damman. US flag SMESA ships departing Bremerhaven, Germany, and Rotterdam, Netherlands, transferred their cargo to foreign flag companies at Alexandria for transport to Jeddah and Ad Damman. East Coast, West Coast, and European sailings accounted for about 56 percent, 36 percent, and 8 percent respectively of SMESA containers shipped. Average sailing times were 35, 30, and 15 days respectively, including feeder voyages. The SMESA contract also required carriers to arrange line-haul service in Saudi Arabia. The most important legs were between the ports of Jeddah, Ad Damman, and Al Jubayl. Containers traveled inland using the commercial companies' established infrastructure.[2]

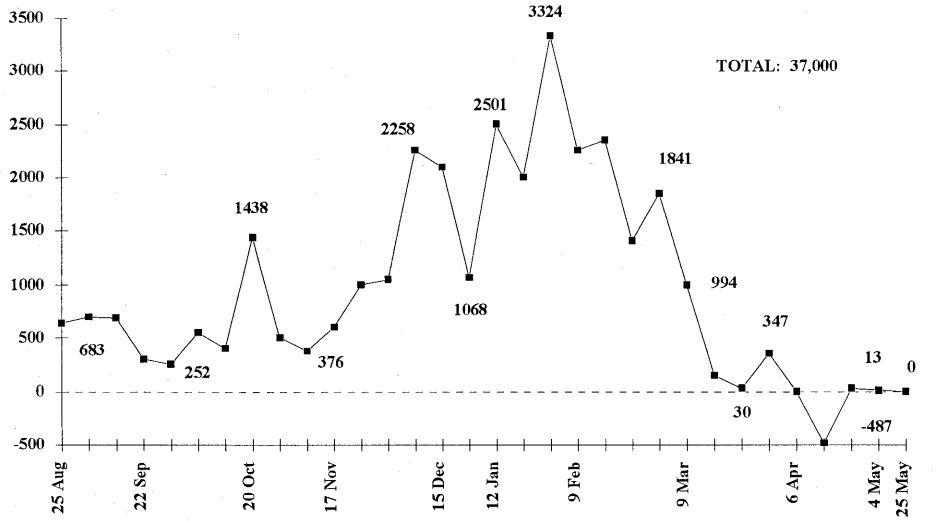
The supported and supporting commanders in chief (CINCs) voiced two major problems with the SMESA shipments: poor container documentation (see "Intransit Visibility," Chapter II) and a "major intermodal container system bottleneck at Ad Damman" in late January. According to MTMC, USCENTCOM's "policy of no night time discharge," due to hostilities, was "greatly extending the SMESA ship time on berth and disrupting the feeder ship schedules."[3]

Poor cargo documentation was one of the biggest problems associated with sealift and airlift sustainment during Desert Shield/Desert Storm. Many shippers failed to comply with Military Standard Transportation and Movement Procedures (MILSTAMP). A key to non-unit cargo management, control, and intransit visibility, MILSTAMP regulations required container documentation to list contents, priorities, project codes, destination, and movement sponsorship. According to Air Force General Hansford T. Johnson, Commander in Chief, United States Transportation Command (USCINCTRANS), sometimes USTRANSCOM "allowed shippers to ship containers to sealift lots with nothing more than 'Saudi Arabia' stated as the destination." Consequently, containers "were unstuffed at ports in Saudi to see what was inside and then restuffed for transport to forward positions." USCENTCOM estimated that due to lack of container documentation it had to open about 40 percent of the containers sent to Dhahran to determine contents and final destination. Containers delayed intheater caused customers to reorder goods, further burdening the transportation

system. For similar reasons, and with like ramifications, cargo backlogs at Dhahran sometimes exceeded 1,000 airlift pallets. (See "Airlift Sustainment Cargo Backlog," Chapter III.) As a result, General Johnson concluded that he and USTRANSCOM could have done better in enforcing document discipline.[4] Overall, USCENTCOM, USTRANSCOM, and its component commands considered SMESA a successful arrangement that should serve as a model for future sustainment operations.

TABLE VI-1

SMESA CONTAINER BOOKINGS
25 Aug 90-25 May 91
(Per Week in FEUs)



SOURCE: MTMC Briefing for 1991 General Officers Workshop, 25-26 Jul 91.

To act as an interface between the commercial companies and the intheater military supply and transportation infrastructures, MTMC dispatched teams of transporters to Ad Damman and Jeddah. Serving as the Ocean Cargo Clearance Authority (OCCA), they administered the provisions of SMESA, enforced performance, verified carrier invoices for payment, provided technical assistance, kept track of containers and, in general, attempted to expedite the deployment. For example, at USTRANSCOM request, the MTMC OCCA arranged with Sea-Land to truck 92 containers from Jeddah on the Red Sea eastward across the Saudi Arabian peninsula to Ad Damman. USTRANSCOM wanted to determine if the land route between the two ports could serve as an alternative means of distribution should either Ad Damman or Al Jubayl come under attack or become

over-burdened. It also wanted to verify if the overland method was economically feasible.[5]

Located on the Red Sea coast midway between Suez and Aden, Jeddah was Saudi Arabia's largest and busiest port. It could accommodate any ship afloat: military and commercial breakbulk, Roll-On/Roll-Off (RO/RO), and container. Four-to-eight lane highways cleared the port and ran all the way to Ad Damman.

Sea-Land feeder vessel *Sharjh* discharged the containers at Jeddah on 13 September and MTMC completed the test on the 23d. The command determined that the land route worked and could even save time, as much as seven days compared to the one by sea. However, it also found the cost to be greater per unit, about $400 per 40-foot container and $500 per 20-foot container. The extra cost, plus problems clearing customs at Jeddah and along the way (Saudi officials treated the containers as diplomatic cargo rather than emergency military cargo), convinced USTRANSCOM to rely exclusively on the sea link unless circumstances at Saudi Arabia's east coast dictated differently. They did not.[6]

Expanding upon the SMESA contract, USTRANSCOM for the second surge deployment established an express sealift service to expedite delivery of air-cligiblc cargo that the command had diverted to sealift for lack of space on aircraft.* (See "Airlift Sustainment Cargo Backlog," Chapter III.) For this new express service, dubbed Sealift Express, Sea-Land scheduled space for about 1,000 40-foot containers on each of four voyages between 23 December and 13 January. A fifth voyage was later added for February 1991. The ships departed Charleston, South Carolina, with the high priority Desert Shield/Desert Storm cargo for Algeciras, Spain, for transloading to foreign flag feeder vessels and onward movement directly to Ad Damman, Saudi Arabia. Originally planned as a 23-day voyage, Sealift Express shipping times actually averaged 25 to 27 days due to "forward delivery problems" primarily related to increasing port congestion and the outbreak of war. The contract ran through 14 March 1991.[7]

CONTAINERIZATION OF AMMUNITION AND UNIT EQUIPMENT

The services containerized surprisingly little ammunition and unit equipment during Desert Shield/Desert Storm. Approximately 2,100 20-foot containers of ammunition and 7,000 40-foot containers of unit equipment moved to the Persian Gulf, most of the former from the United States and the latter from Europe. An additional 2,000 containers were used for Deployable Medical Units.[8]

*Early in Desert Shield, USTRANSCOM worked with MTMC and MSC to speed delivery of high priority cargo to the AOR via sea. As a result, for a short time, Sea-Land carried military cargo direct to Saudi Arabia on its regularly scheduled Sea-Land Express operation. However, the small amount of Desert Shield cargo earmarked for express service prompted the company to discontinue such sailings for the military.

Early in Desert Shield and throughout the operation, USTRANSCOM promoted containerization of ammunition and unit equipment.[9] The command argued containerization would free up space on Fast Sealift Ship (FSS) and other RO/RO vessels for transport of vehicles and also free up military terminals for unit deployments since most container shipments embarked from commercial port facilities operated by commercial ocean carriers. Consequently more units could be deployed simultaneously. Container ships were much more efficient than breakbulk vessels. USTRANSCOM estimated that six container ships could haul the equivalent of 18 breakbulk ships. Containerization would also speed deployment because container ships could be loaded and unloaded faster than breakbulk ships. In addition, USTRANSCOM stressed that containerization of unit cargo and ammunition would speed deployment by capitalizing on the commercial industry's intermodal expertise and capabilities. Furthermore, the command argued it could save money, increase security, and improve intransit visibility through containerization.[10]

USTRANSCOM had little success at containerizing ammunition and unit cargo for several reasons. Early in the operation, Army General H. Norman Schwarzkopf, the supported Commander in Chief, USCENTCOM (USCINCCENT), and the Army concluded that intheater infrastructure lacked the equipment necessary to handle containerized ammunition. In particular, USCENTCOM had a limited field ammunition supply point materiel handling capability.[11] The Army also feared that containerization of ammunition would slow the deployment. "Container movement normally requires longer lead-times for positioning of assets at shipper locations and rail transit to the port," Army Materiel Command noted. Throughout the operation, "changing priorities" and "lack of firm requirements" were in part behind the Army's hesitancy to containerize ammunition.[12] Consequently, USTRANSCOM shipped most ammunition breakbulk, the same way the Phoenicians did it, Navy Vice Admiral Francis R. Donovan, MSC's Commander, later remarked.[13] Likewise, Army Lieutenant General Hubert G. Smith after the war emphasized the efficiencies and effectiveness to be gained by containerizing ammunition. A brigadier general during Desert Shield/Desert Storm serving as MTMC Eastern Area Commander in charge of military port operations on the US East Coast and in the Gulf of Mexico, General Smith recorded that stevedores at Military Ocean Terminal, Sunny Point (MOTSU), North Carolina, "took only 68-70 hours to load the *Noble Star* with containerized ammo compared to an average load time of 8-14 days for [breakbulk] ammo ships."[14]

Containerizing unit equipment was an even bigger challenge for USTRANSCOM. On 24 August General Johnson shared with General Schwarzkopf his concept for improving unit closure through containerization. On 2 September General Schwarzkopf replied "at this point in the deployment maintaining unit integrity during reception is essential. Our current assessment is that the delivery of containerized unit equipment should be delayed until after

closure of combat forces at approximately C+70 (16 October 1990). By then an adequate container management and distribution system should be on the ground."[15]

The Army also feared containerization would slow unit deployment. In mid-September, in response to a similar USTRANSCOM proposal to test the feasibility of containerizing a unit for deployment from the United States to the Persian Gulf, Forces Command (FORSCOM) replied "given the sensitivities associated with closure of the currently deploying force, we recommend that the test be conducted during the deployment of rotation forces." Consequently, FORSCOM and USTRANSCOM agreed to test containerizing a unit deploying in mid-November. USTRANSCOM developed a force module consisting of units suitable for the test and then forwarded it to FORSCOM for consideration and selection. In its urgency to meet surge deployment requirements, FORSCOM abandoned the plan.[16]

Several of USTRANSCOM's most important customers argued that container shortages prohibited expanding the use of boxes. Early in the deployment, the Army, FORSCOM, USCENTCOM, and MTMC concluded there were not enough government containers, military vans, and other intermodal devices available to support ammunition and unit equipment moves and still meet other worldwide commitments.[17] In late January 1991, the Army's Office of the Deputy Chief of Staff for Logistics noted that up to that point most of the ammunition--for the Air Force, Navy, and Marine Corps as well as the Army--had been shipped breakbulk "due in part to lack of containers."[18] From the beginning, many commercial containers remained in the AOR as storage boxes so that by the time Desert Storm commenced even the SMESA contractors considered the container shortage critical. On 9 February, MTMC reported to USTRANSCOM that there was "a worldwide shortage of boxes....Within the past four weeks the number of containers backlogged intheater, currently 8,800 FEUs [forty-foot equivalents], has more than doubled....At the present return rate for empties, the number of containers intheater will double within five weeks."[19] At war's end, USTRANSCOM was coordinating a DOD effort to buy containers, some with Japanese money.[20]

In conclusion, unit commanders, supported by General Schwarzkopf, were reluctant to containerize unit equipment because they believed it would split up their precious cargo into hundreds of boxes to be transported on a multitude of ships. As a result, they favored RO/ROs over container vessels so they could consolidate their cargo and equipment on as few ships as possible and thus maintain unit integrity. Unfamiliarity with containerization also contributed to service hesitancy to adopt the method for equipment and ammunition. Had they really wanted to use containers, they could have purchased them early in the deployment for use later on when the theater commander was ready to receive them.

USTRANSCOM could also have done more to promote containerization. "After the war, in meeting with all the joint logistics commanders," General Johnson reminisced, "I realized that no one said no to containerization of ammunition. We simply did not push hard enough for it."[21] In hindsight, several of USTRANSCOM's logisticians concluded that the command should have forced the issue by simply telling customers they would get containerships instead of RO/ROs for their unit equipment, and "then let them sort it out."[22]

Commercial shipping lines were ready to help. Their intermodal infrastructure was in place to move vast quantities of containerized equipment over land and ocean routes. During Desert Shield/Desert Storm, for example, the military never used more than 30 percent of the commercial liners' available lift capability. American President Lines (APL) argued that the military could expand lift capacity by using the liners' intermodal pipeline to move containerized equipment west and east at the same time. (It took only two days longer to get from Oakland to the Persian Gulf than it did from Jacksonville.) This would also expand throughput by increasing the number of seaports of embarkation (SPOEs) for outload. Additionally, shipments running on regularly scheduled liners would eliminate arrival peaks and valleys thus helping to decrease backlogs and queuing at seaports of debarkation (SPODs). Furthermore, the military would benefit from the commercial liners' intransit visibility capabilities. (See "Intransit Visibility," Chapter II.) For instance, during Desert Shield/Desert Storm Sea-Land set up a data transmission network in Ad Damman that allowed commercial companies and military units in Europe, the United States, and the AOR to pinpoint the location of SMESA containers en route. Perhaps most importantly, APL argued, containerizing unit equipment--especially combat support and combat service support vehicles--and placing it in the liners' intermodal pipeline would allow the military to move, simultaneously, combat units and the logistical structure needed intheater for combat units to take the offensive. Following Desert Shield/Desert Storm, the US commercial liner services recommended that the DOD take into account their intermodal capacity and capabilities when reviewing regional CINC operation plans.[23]

POST-DESERT SHIELD/DESERT STORM CONTAINERIZATION

As a member of the Joint Staff-sponsored General/Flag Officer Steering Group on Containerization, USTRANSCOM would continue its support and advocacy of containerization in DOD following the war. It would participate in the development of the DOD Containerization Master Action Plan and emphasize containerization during deliberate planning and Time Phased Force Deployment Data (TPFDD) refinement conferences. It would also champion a West Coast port capable of handling containerized ammunition. To make better use of containers on hand, it would improve container staging, stuffing, and stripping methods. It would also seek funds to increase the number of containers in the

DOD inventory and enforce document discipline under Military Standard Transportation and Movement Procedures. Additionally, the command would work to make the Defense Transportation System compatible with the commercial sector's intermodal systems. Realizing that containerization was "hampered by a steep learning curve," the command would push for the services to use containers and intermodal systems in peacetime so that they would feel comfortable using them during war. Immediately, the command would plan for containerization of units redeploying from the Persian Gulf. However, General Johnson knew that unless USTRANSCOM became a peacetime as well as wartime operational command, his power to influence service operations short of war would remain limited.[24]

***RO/RO-Container Ship* Lyra**

CHAPTER VI NOTES

1. See also File (S-DECL OADR), TCHO, "Special Middle East Sealift Agreement" located in the USTRANSCOM Office of History Desert Shield/Desert Storm Archives, (hereafter cited as TCHO Archives); Msg (S-DECL OADR), MSC N00 to TCCC, et al., Desert Shield Sustainment Concept of Operations, 172358Z Aug 90; Msg (U), TCDC to MSC N0, Desert Shield Sustainment Concept of Operations, 220054Z Aug 90; Memo (U), MSC N102, Contracting to All OFFERORS, Amendment No. 4 RFP-2300 originally issued on 10 Aug 90, Ref. N0003389R2300 (b), Second Cycle, Negotiated Rates for Ocean and Intermodal Transportation for the Movement of Containerized and Breakbulk Cargo between Continental Europe and the UK, the US East, Gulf and West Coasts, the Far East and Mediterranean Areas to Middle East Destinations, 18 Aug 90; Article (U), *Journal of Commerce*, (hereafter cited as *JC*), Bruce Vail, "Gulf Crisis Puts Growing Demand on World Fleet," 27 Dec 90; MFR (U), USTRANSCOM/CAT, Theater SMESA Operational Issues, 30 Jan 91; Article (U), *Defense Transportation Journal*, (hereafter cited as *DTJ*), "The Special Middle East Shipping Agreement (SMESA)," Apr 91, pp. 19-20; Article (U), *DTJ*, "Sea-Land's Global Team Effort," Jun 91, pp. 70-71; Point Paper (U), TCJ5-ST, American President Lines (APL) Visit, 19 Jul 91, 18 Jul 91; Article (U), *Containerization International*, Jane R. C. Boyes, "Post Desert Storm Reflections," Aug 91, pp. 32-40.

2. See note above; Teleconf Msg No. 10, USTRANSCOM/CAT to USEUCOM TLCC, Prioritization Guidance (U), 1922, 1 Dec 90.

3. Msg (U), COMTMC/MT-EOC to USTRANSCOM/J3/4, Theater SMESA Operational Issues, 261630Z Jan 91.

4. Msg (Secret Downgraded to Unclassified), USCENTCOM J3/4-L to USTRANSCOM/CAT, Initial Impressions (U), 161800Z Nov 90; Msg (U), TCJ3/J4 to CINCFOR J4-TR, et al., Application of Military Standard Transportation and Movement Procedures (MILSTAMP) during Team Spirit 93 (TS 93), 151544Z Jul 92; Brfg (U), CAT Logistics Cell to USCINCTRANS, Improving Intransit Visibility, 11 Dec 92; JULLS Input (U), USTRANSCOM/CAT Log Cell, [Desert Storm Container Documentation], n.d.; JULLS Input (U), USTRANSCOM/CAT Log Cell, [Desert Storm Container Documentation], n.d.; MFR (U), TCHO Discussion with MTMC [Col Dean Smith], Container Documentation, 3 Jan 93; JULLS Rpt (U), TCJ5-D, Operation Desert Shield/Desert Storm, n.d.

5. Teleconf Msg No. 91 (S-DECL OADR), MTMC EOC to USTRANSCOM/CAT, et al., Desert Shield: Delivery of Sustainment Cargo to Saudi Arabia, 1728, 16 Aug 90; Msg (S-DECL OADR), TCDC to USCENTCOM J4, et al., Desert Shield Sustainment Cargo (U), 301915Z Aug 90; Msg (S-DECL

OADR), USCENTCOM J4/7 to USCINCTRANS, et al., (Classified Subject), 090200Z Sep 90; Info Paper (FOUO), MTMC IT, MTMC Saudi Arabia Assistance, 11 Sep 90; Teleconf Msg No. 325 (U), MTMC DC to MTMCEUR EOC, et al., Ocean Cargo Clearance Authority (OCCA) Saudi Arabia, 2008, 13 Sep 90; Msg (S-DECL OADR), MTMC/MTIT to MTMCEUR EUR-TOPS, et al., Desert Shield Sustainment Test Plan for Jiddah Discharge (U), 142240Z Sep 90.

6. Msg (U), MTMC IT to USTRANSCOM/CAT, et al., Final Report-Jeddah Test, 052245Z Oct 90.

7. Msg (S-DECL OADR), TCDC to MSC N00, MTMC/CG, Desert Shield Sustainment Requirement (U), 011754Z Sep 90; Msg (S-DECL OADR), MSC N00 to TCDC, MTMC CG, Sustainment Containerized Cargo Requirement (U), Sustainment Containerized Cargo Requirement (U), 131705Z Oct 90; Msg (U), MTMC IT to DA DALO-TSP, et al., Designation of Supply Sources for Desert Shield, 192045Z Oct 90; MFR (U), TCHO, Sealift Express/Sea-Land Express-Interview with Commander Roy Adams, TCJ3/J4-LLJ, 19 May 92; Msg (CONF-DECL OADR), MTMC EOC to DA AOC, et al., Priority Delivery under the Special Middle East Sealift Agreement (SMESA) (U), 081800Z Dec 90; Teleconf Msg No. 356 (CONF-DECL OADR), TCJ3/J4 to MSC CAT, MTMC EOC, Short Term Fast Delivery Service (Sealift Express), 2238, 8 Dec 90; Teleconf Msg No. 429 (CONF-DECL OADR), USTRANSCOM/CAT to MSC CAT, MTMC EOC, Sealift Express, 1655, 10 Dec 90; Msg (U), MTMC IT to USTRANSCOM/CAT, et al., CONOPS for Surface Express Service, 122030Z Dec 90; Msg (U), USTRANSCOM to USCENTCOM CAT, et al., Desert Shield Sealift Express Service, 140140Z Dec 90; Msg (U), MTMC IT to JS J4-LRC, et al., Sealift Express Service, 140200Z Dec 90; Msg (U), MTMC IT to MTMCEA IT, et al., Sealift Express Service, 160200Z Dec 90; Msg (U), AFDCO DSTL to TCJ3/J4 CAT, et al., Airlift Allocation for Sustainment, 172000Z Dec 90; Msg (S-DECL OADR), USCENTCOM J4/7 to USTRANSCOM/CAT, et al., Sealift Express Service (U), 191500Z Dec 90; Msg (U), USCENTAF LG to TCJ3/J4 CAT, et al., Airlift Allocation for Sustainment, 091830 Jan 91; Msg (U), MTMC IT to MTMC MTEA-IT, et al., Special Sailing of Sea-Land's Express Service, 221900Z Jan 91; Msg (U), MTMC IT to DA DALO-TSP, et al., Special Sailing of Sea-Land's Express Service, 252300Z Jan 91; Msg (S-DECL OADR), MTMC EOC to TCJ3/J4, et al., Theater SMESA Operational Issues (U), 261630Z Jan 91; Msg (U), TCJ3/J4 to MTMC CG, et al., Theater SMESA Operational Issues, 310632Z Jan 91; Msg (U), TCDC to MSC N00, et al., Desert Storm Sealift Express, 051611Z Feb 91; Msg (U), MTMC CG to TCJ3/J4, MSC N00, Desert Storm Sealift Express, 081900Z Feb 91; Msg (U), USCINCTRANS to MSC N00, MTMC CG, [Sealift Express], 140356Z Feb 91; Msg (U), USTRANSCOM/CAT to MTMC EOC, et al., Sealift Express Service Extension, 192349Z Feb 91; Msg (U), MTMC CS to TCJ3/J4, et al., Employment of SMESA Carrier Assets, 261830Z Feb 91; Article (U), *JC*, Erich E. Toll, "Sea-Land to Continue Persian Gulf Express," 12 Jul 91.

8. Teleconf Msg No. 485 (U), MTMC EOC to USTRANSCOM/CAT, MSC CAT, JOPES Manifesting of Containerized Unit Cargo, 2229, 30 Nov 90; Background Info (U), TCCC's Interview with Ms. Jane Boyes, Editorial Director of *Containerisation International*, (Containerization in Desert Shield/Desert Storm), n.d.; Msg (U), MTMC IT to MAC/CAT-TR, CONOPS For Surface Express Service, 122030Z Dec 90; Point Paper (U), USTRANSCOM/CAT, Sealift Express, n.d.; Brfg (U), Sealift Express, n.d.; Memo (U), TCHO to JS J4 Mobility Div, [Answer to GAO's Question: "What percentage of Desert Shield/Desert Storm sealift dry cargo was shipped in containers?"], 9 Jul 92.

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10. Point Paper (U), TCJ5-DT, Containerization, 12 Jul 91; Excerpt from Statement (U), USCINCTRANS to Committee on Armed Services, US Senate, "Containerization and Intermodalism," 10 Mar 92.

11. Msg (U), DA DALO-LOC-TSP-C to MTMC IT, et al., Desert Shield-Ammo Container CONOPS (U), 241910Z Aug 90; Msg (U), MTMC LO-L to USTRANSCOM/CAT, et al., Container Requirements, Desert Shield, 312347Z Aug 90; Msg (S-DECL OADR), USCENTCOM J4/7 to MTMC MTEOC, et al., Desert Shield-Ammo Containerization (U), 082232Z Sep 90; Point Paper (U), TCJ3/J4 CAT, Container Management in AOR, 29 Sep 90; Msg (U), TCDC to JS J4, et al., Container Management, 031400Z Oct 90; Msg (S-DECL OADR), TCDC to COMSC, CDRMTMC, USTRANSCOM LNO, USCENTCOM J4, Ammunition Shipments for Desert Shield (U), 060833Z Nov 90; Msg (S-DECL OADR), USAF LEYW to AFLC BS-MMW, et al., Containerization of Munitions for Operation Desert Shield (U), 281846Z Dec 90.

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13. Article (U), *JC*, Daniel F. Kelly, "Sealift Command's Donovan Touts Containerization, Intermodalism," 26 Sep 91.

14. Intvw (U), Dr. James K. Matthews, Command Historian, USTRANSCOM, with LTG Hubert G. Smith, Deputy Commander in Chief, USTRANSCOM, 27 Sep 95.

15. Msg (S-DECL OADR), TCCC to USCENTCOM/CC, et al., Concept for Improved Closure of Units, 220619Z Aug 90; Memo (U), 7th Spt Gp/CC to MG Wakefield, [Desert Shield/Desert Storm Lessons Learned], 15 May 91, w/atch: Memo (U), 7th Corps Spt Gp (Forward) to DCSLOG, USA, Lessons Learned Desert Shield/Desert Storm, 3 Mar 91.

16. See Note 9. Msg (U), FORSCOM CS to TCJ3/J4, et al., Containerization of Unit Equipment for Deployment/Desert Shield, 011850Z Oct 90; Issue Paper (U), TCJ3/J4 for NDTA Sealift Committee, Desert Shield Lessons Learned/Relearned-Intermodalism, 25 Oct 90; Point Paper (U), USTRANSCOM/CAT (Log Cell), US Army Use of Containerization during Operations Desert Shield and Desert Storm, 5 Mar 91.

17. File (S-DECL OADR), TCHO, "Containerization of Ammunition and Unit Cargo," TCHO Archives.

18. Msg (U), DA DALO-TSP to TCJ3/J4, MTMC LOL, MSC N10, Desert Shield Container Requirements, 282100Z Jan 91.

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20. See Note 17.

21. See History (U), USTRANSCOM/HO, MAC/HO, *General Hansford T. Johnson, Commander in Chief, United States Transportation Command and Air Mobility Command, An Oral History*, Dec 92, GPO.

22. Intvw (U), Dr. James K. Matthews, Command Historian, USTRANSCOM, with USTRANSCOM/CAT, Logistics Cell and Surface Cell Members during Desert Shield/Desert Storm, Jun 92.

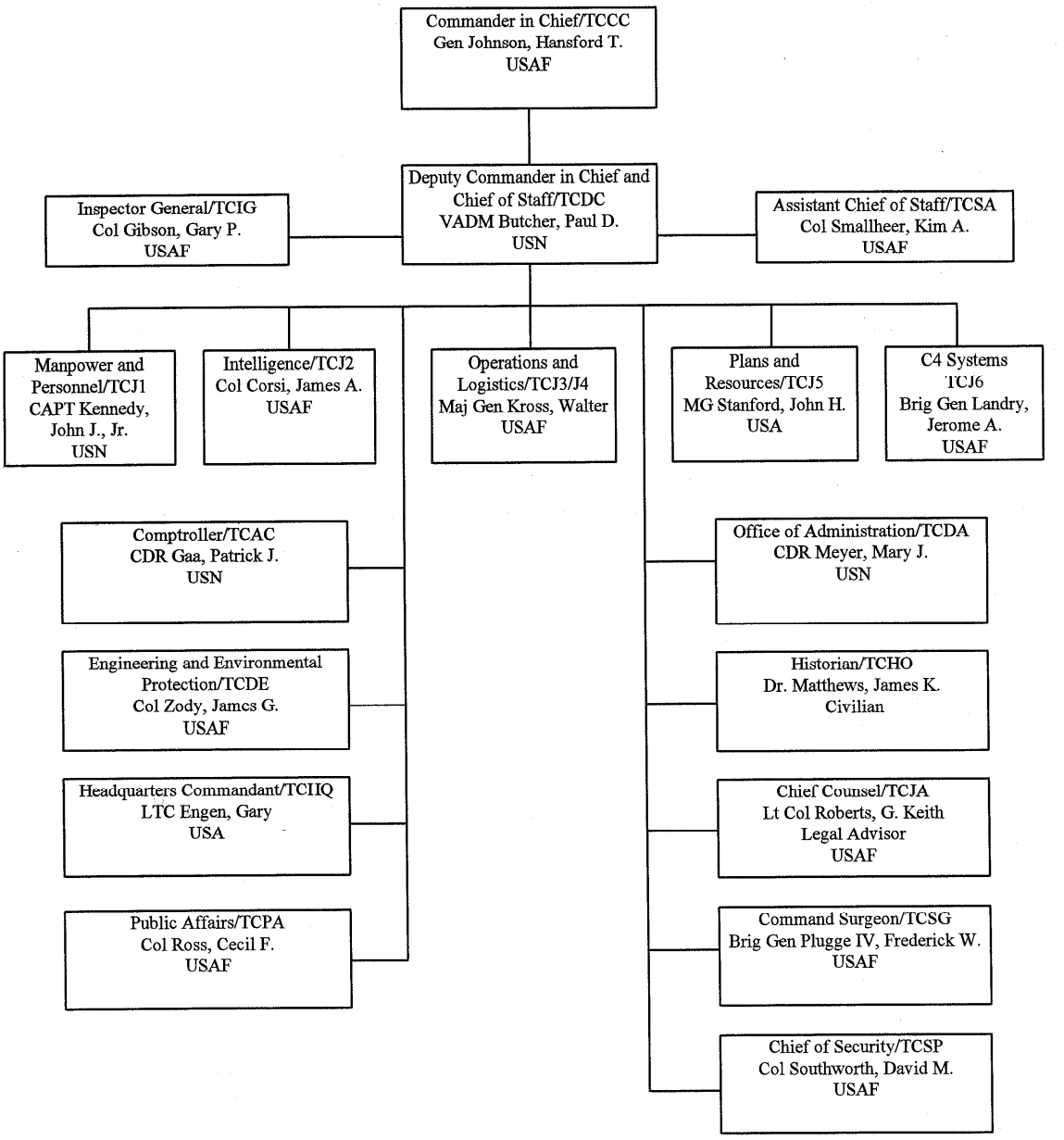
23. Rpt (U), APL, [US Flag Commercial Liners during DS/DS], Jan 94.

24. Point Paper (U), TCJ3/J4-LLD, USTRANSCOM Position on Intermodalism, 25 Oct 90; Teleconf Msg No. 2 (U), USTRANSCOM/CAT to USCENTCOM JMC, USTRANSCOM LNO, MTMC EOC, MSC CAT, Containers for Unit Moves, 1651, 30 Mar 91; Msg (U), USTRANSCOM/CAT to USTRANSCOM LNO, USCENTCOM Riyadh, et al., Maximization of Container Utilization, 081511Z Jun 91; Point Paper (U), TCJ3/J4-LL, USTRANSCOM Containerization Initiatives, n.d.; Article, *American Shipper*, Joseph Bonney, "Logistics: The Military Invented the Word but Failed to Use the System," Jul 91.

TABLE VI-2

UNITED STATES TRANSPORTATION COMMAND ORGANIZATIONAL CHART

(As of August 1990)



CHAPTER VII

OPERATIONAL SUPPORT

OVERVIEW

Although United States Transportation Command (USTRANSCOM) and the Transportation Component Commands' (TCCs') active duty operators and logisticians played perhaps the most visible role in the Desert Shield/Desert Storm deployment, reservists and civilians were equally important to the operation's success. While the TCCs used reservists from their respective parent service, USTRANSCOM's Total Force included reservists from the Army, Navy, and Air Force. Primarily working as Crisis Action Team (CAT) members, they also augmented many other command functions during the deployment. The USTRANSCOM Intelligence Directorate analysts worked side by side with command CAT Sealift, Airlift, and Surface Cell members providing a wide variety of operationally-oriented assessments and studies. USTRANSCOM's Special Staff were also CAT team members. The command's Comptroller tracked total US transportation costs and transportation and fuel donations from US allies and the USTRANSCOM Office of Security helped protect from sabotage and terrorist attack American troops, infrastructure, and transportation assets. The USTRANSCOM Historian ensured the preservation of Desert Shield/Desert Storm documentation and the command's Office of Public Affairs guaranteed that the USTRANSCOM story was disseminated accurately, widely, and in a timely manner. (See Table VI-2.)

TOTAL FORCE INTEGRATION

President George Bush initiated Reserve augmentation for Desert Shield on 23 August 1990 activating up to 48,800 reservists.* The President increased the ceiling to 125,000 on 14 November and to 188,000 on 1 December. On 19 January 1991, the Secretary of Defense, following the President's guidance, increased the ceiling for the last time during Desert Shield/Desert Storm, to 360,000.[1] Desert Shield/Desert Storm marked the first Reserve force call-up in response to a foreign crisis since January 1968 when 35,000 reservists were activated during the Pueblo Crisis.[2]

It is readily apparent from Table VII-1 that USTRANSCOM and its component commands could not have performed their wartime missions without Reserve augmentation during Desert Shield/Desert Storm. At war's end the commands' augmentees--from the US Army Reserve (USAR), US Naval Reserve (USNR), and Air Reserve Component (ARC), composed of the Air National Guard (ANG)

*The Reserve Component consists of the Ready Reserve, which was called up for Desert Shield/Desert Storm; Standby Reserve; and Retired Reserve. The Ready Reserve has three parts: Selected Reserve, Individual Ready Reserve, and the Inactive National Guard. In the discussion that follows, "Reserve" refers to "Ready Reserve."

TABLE VII-1

RESERVE COMPONENT AUGMENTATION MONTHLY HIGHS

	USTRANSCOM		MAC		MTMC		MSC		TOTALS	
	CALL-UP[1]	VOLUNTEER	CALL-UP[1]	VOLUNTEER	CALL-UP[1]	VOLUNTEER	CALL-UP[1]	VOLUNTEER	CALL-UP[1]	VOLUNTEER
Aug 90		11 USNR 1 USAFR	1,001	1,589 ANG 5,426 USAFR	604	225	51	87	1,656	7,379
Sep 90	26 USNR	10 USNR 2 USAR 1 USAFR	373 ANG 3,419 USAFR	1,429 ANG 2,732 USAFR	605 USAR 7 USNR	64	208	90	4,638	4,328
Oct 90	26 USNR	4 USNR 5 USAR	820 ANG 3,669 USAFR	892 ANG 2,236 USAFR	533 USAR 7 USNR	41	236	56	5,291	3,234
Nov 90	26 USNR	8 USNR 5 USAR	824 ANG 3,982 USAFR	689 ANG 1,843 USAFR	605 USAR 7 USNR	32	246	9	5,690	2,586
Dec 90	1 USAR 32 USNR	5 USNR 4 USAR	1,649 ANG 6,526 USAFR	500 ANG 731 USAFR	670 USAR 7 USNR	78	373	2	9,258	1,320
Jan 91	33 USNR 2 USAR	4 USNR 4 USAR	2,157 ANG 13,485 USAFR[2]	1,563 ANG USAFR[3]	790 USAR 7 USNR	28	385	1	16,859	1,600
Feb 91[4]	33 USNR 6 USAR	4 USNR	3,473 ANG 15,330 USAFR	775 USAFR 538 ANG	797 USAR 8 USNR	22	409	2	20,056	1,341
Mar 91[4] (1-10 Mar)	33 USNR 6 USAR	4 USNR	3,571 ANG 16,147 USAFR	944 USAFR 621 ANG	912 USAR 8 USNR	3	427	5	21,104	1,577

1 Individual Mobilization Augmentees are included in reserve callup totals.
2 Includes 232 USAFR-gained personnel assigned to Military Airlift Command.
3 No breakout for ANG and USAFR for January.
4 Army Temporary Tour of Active Duty personnel, previously reported as volunteers, are now counted under call-up due to transfer of status from 10 USC 672 to 10 USC 673.

ANG = Air National Guard
USAFR = United States Air Force Reserve
USAR = United States Army Reserve
USNR = United States Naval Reserve

SOURCE: Reserve Manning Documents (US Transportation Command and Components: Military Airlift Command, Military Sealift Command, and Military Traffic Management Command).

and US Air Force Reserve (USAFR)--peaked at 22,681. Military Airlift Command (MAC) augmentation reached 21,283 (4,192 ANG and 17,091 USAFR). The other commands' Reserve strength peaked as follows: 43 at USTRANSCOM (37 USNR and 6 USAR); 923 at Military Traffic Management Command (MTMC) (915 USAR and 8 USNR); and 432 USNR at Military Sealift Command (MSC).[3] Civilians were also an integral part of the Total Force structure. In late August the Joint Staff asked USTRANSCOM to assess the result of proposed DOD civilian furloughs. The command determined that 100 percent of USTRANSCOM and the TCCs' civilian workforce was "engaged in direct activity/support" of the deployment. Consequently, any such furloughs would "severely impact" the operation in scheduling, freight forwarding, loading, contracting, equipment maintenance, safety inspection, pay and aircraft maintenance." Additionally, the commands' civilian managers often volunteered to work overtime without claiming extra pay or other compensation.[4]

Compared to other Army major commands, MTMC Reserve strength of about 2,000 personnel was not very large, but it made up about three-fourths of the command's total military strength and all of its Transportation Terminal Units (TTUs), which ran the military terminals at the seaports of embarkation (SPOEs). MTMC TTU reservists were assigned to 17 SPOEs during the operation. As shown in Table VII-2, the MTMC Reserve contained 27 units, 12 of which were activated during Desert Shield/Desert Storm. Several other units, including seven TTUs, supported the operation during training periods or on a volunteer basis. MTMC's 1205th Railway Services Unit (RSU), for example, augmented civilian rail crews at Military Ocean Terminal, Sunny Point (MOTSU), North Carolina, with teams of 12 volunteers, on a monthly rotating basis between September and December, to move rail cars from the commercial rail interchange to various locations around the port. On 15 January, the unit was called to active duty.[5]

Army Major General John R. Piatak, MTMC's Commanding General, believed Desert Shield/Desert Storm revealed the inadequacy of TTU organizational equipment allowances. His reservists' computers were woefully out of date and the TTUs had far too few radios and vehicles. He used an anecdote to underscore the point. While visiting the 1192d TTU at the port of Beaumont, Texas, he noticed a soldier driving by in a new Lincoln Town Car. Having made it clear to his active duty and Reserve troops that they were not to rent expensive cars, he was upset until he learned that the soldier owned the car and was using it to conduct government work because no government vehicle was available.[6]

It would be difficult to overstate the importance of the ARC to MAC's wartime mission. While the command's active duty force numbered just over 70,000 in 1990 (see Table II-3), MAC-gained ARC forces totaled about 66,000, representing 48 percent of the total MAC force. Stated from the service perspective, the Air Force in 1990 allocated nearly 70 percent of its Reserve

personnel to Military Airlift Command. At the start of Desert Storm on 17 January 1991 (1900 EST, 16 January), 52 percent of MAC forces in the theater of operations were reservists (11,226 out of a total of 21,400). By the end of the war, approximately 19,800 MAC reservists (16,200 USAFR and 3,600 ANG) had been called up for duty.[7] Of all the major Air Force commands, only Tactical Air Command deployed more troops, active duty and reserve, to the area of responsibility (AOR) than MAC.[8]

TABLE VII-2

CALL-UP OF MTMC ARMY RESERVE UNITS

Type of Unit	Number of Units	Number of Units Called Up	Mission
Deployment Control	3	2	To assist deploying units
Transportation Terminal	18	6*	To run the seaports of embarkation
Port Security	3	3	To provide port security during loading
Cargo	2	0	Not called up during Desert Shield
Railway Support	1	1	To operate railway equipment

*Seven additional TTUs (1,033 personnel) were used during their training periods to meet the peak Desert Shield demands.

SOURCE: Study (U), Adapted from Institute for Defense Analyses, "The Call-Up of the Reserve Component for Desert Shield/Storm," by William B. Buchanan, 2 Dec 93.

MAC relied heavily on the ARC in normal peacetime operations as well as in crises and during war. (See Table VII-3.) In August 1990, just prior to Desert Shield, 70 percent of the command's aerial port personnel, 90 percent of its aeromedical evacuation crews, 60 percent of the C-141 crews, 62 percent of the C-5 crews, and 60 percent of the C-130 crews were in the ARC. At that time, 20 percent of the Associate Reserve aircrews (USAFR aircrews from C-141 and C-5 Associate Reserve Squadrons who flew aircraft from the associate active squadron) were flying MAC missions on any given day. Additionally, the ARC possessed a substantial number of airlift aircraft. In 1990, there were 40 C-5s and 16 C-141s in the ARC. (The Reserve also possessed 300 C-130s.)[9]

Another point needs emphasis in regard to MAC's reliance on the Reserve. The protracted call-up of C-5 ARC units (the ninth and final squadron was not

activated until 19 February), and the protracted and less-than-complete call-up of C-141 units (only 9 of the 12 C-141 ARC squadrons were called to duty for the operation) retarded MAC's ability to meet wartime utilization rates set forth in planning documents (see "US Strategic Airlift Fleet," Chapter III),[10] and highlighted the Defense Transportation System's (DTS's) heavy dependency on volunteer reservists during the operation, especially for the Desert Shield surge. In August, USTRANSCOM and its component commands had 9,034 reservists on duty; 7,378 of these (82 percent) were volunteers. Volunteers made up 88 percent of MAC and 100 percent of USTRANSCOM Reserve augmentation in August. Military Airlift Command ARC volunteers helped load and fly the first aircraft to deploy in support of Desert Shield. During the month of August, about 7,000 ARC volunteers supported MAC operations. Overall, about 18,000 volunteers served with the command between August 1990 and January 1991, either in the theater of operations or filling in for active duty MAC personnel who had deployed to the Gulf region. At USTRANSCOM, volunteers served primarily with the CAT, allowing it to operate fully-manned around the clock during the critical first weeks of the deployment. In August, volunteers made up 42 percent of MTMC's Reserve force. Most of them were in Transportation Terminal Units loading the first Fast Sealift and Ready Reserve Force (RRF) ships activated for the deployment. More specifically, MTMC Reserve volunteers were crucial to the opening of the ports of Savannah, Georgia, and Jacksonville, Florida, for the early deploying 24th Infantry Division (Mechanized) and the 101st Airborne Division (Air Assault), respectively. Some volunteers started to work in Jacksonville on the weekend of 11 August and 60 more arrived at the port the following week. A mix of MTMC active duty and reservist volunteers on an annual two-week drill opened Savannah.[11] (See "US Ports," Chapter V.)

Air Force General Hansford T. Johnson, Commander in Chief, USTRANSCOM, (USCINCTRANS) considered such heavy reliance on volunteers to be risky. He wanted to rely instead on "rapid-access mobility reserve modules and call-up procedures for them" which USTRANSCOM and its component commands could use prior to the Presidential 200,000 Reserve activation. In essence, he wanted a guaranteed and quantifiable pool of reservists to "prime the strategic transportation system" for war.[12]

USTRANSCOM learned another important Reserve-related lesson during Desert Shield/Desert Storm: the expertise it gained from having a mix of services in its Reserve augmentation proved invaluable. Consequently, at the end of the war the command proposed to the Joint Staff the formation of a USTRANSCOM Joint Transportation Reserve Unit (JTRU). Built around Naval Reserve USTRANSCOM Detachment 118, a St. Louis unit assigned to USTRANSCOM, the new joint unit would include all the authorized USTRANSCOM Reserve augmentation of 65 Selected Reserve billets and 31 Joint Mobilization Augmentees. Under the proposal, the billets would be redistributed to achieve

service balance: 32 each in the Army, Navy, and Air Force plus three new Marine Corps billets. In the command's view, mobilization readiness could be best achieved if all reservists, regardless of service affiliation, trained as one unit. It was especially important to the command that the unit trained the way it would fight. If approved, the USTRANSCOM Reserve unit would be the first joint Reserve unit.[13]

TABLE VII-3

ACTIVATION OF MAC RESERVE COMPONENT MILITARY AIRLIFT SQUADRONS

DATE	C-5 UNIT AND TYPE*	C-141 UNIT AND TYPE
25 Aug 90	137 MAS (ANG)† 337 MAS (AR)†	183 MAS (ANG)† 732 MAS (Associate Reserve) 756 MAS (AR)†
31 Aug 90	68 MAS (AR)† 301 MAS (Associate Reserve) 326 MAS (Associate Reserve)	
4 Sep 90	312 MAS (Associate Reserve) 709 MAS (Associate Reserve)	
9 Sep 90		335 MAS (Associate Reserve) 701 MAS (Associate Reserve)
10 Sep 90		708 MAS (Associate Reserve) 97 MAS (Associate Reserve)
24 Jan 91		300 MAS (Associate Reserve) 729 MAS (Associate Reserve)
19 Feb 91	702 MAS (Associate Reserve) 730 MAS (Associate Reserve)	

*Military Airlift Squadron (MAS); Air Reserve (AR); Air National Guard (ANG).

†Unit equipped

SOURCE: Military Airlift Command (SECRET/DECL-OADR), Annual History, 1 Jan-31 Dec 90, info used is unclassified.

ACCOUNTING

USTRANSCOM served as the government's focal point for tracking Desert Shield/Desert Storm transportation costs. Based on the component commands' inputs, the USTRANSCOM Office of the Comptroller computed those costs at the end of March to be $4.57 billion, as shown in Table VII-4. This included ship breakouts, ship activations, labor, travel, contracts, supplies, equipment, fuel, and intheater transport.[14]

TABLE VII-4

DESERT SHIELD/DESERT STORM TRANSPORTATION COSTS

(As of 31 March 1991)
($000)

	USTRANSCOM	MAC	MTMC	MSC	TOTAL
Aug 90	21	162,674	13,401	110,576	286,672
Sep 90	21	224,081	21,603	175,779	421,484
Oct 90	40	229,778	10,928	176,084	416,830
Nov 90	23	171,505	15,351	173,311	360,190
Dec 90	37	341,508	37,752	270,321	649,618
Jan 91	496	443,248	40,241	419,290	903,275
Feb 91	47	430,403	47,277	297,922	775,649
Mar 91	370	370,820	7,414	383,937	762,541
TOTAL	1,055	2,374,017	193,967	2,007,220	4,576,259

SOURCE: US Transportation Command Comptroller Desert Shield/Desert Storm Transportation Cost Reports.

The command also kept track of donated foreign airlift and sealift for the US government. As seen in Table VII-5, South Korea, Japan, Kuwait, and Italy had contributed by the end of March a total of 200 airlift missions worth an estimated $73.9 million. Japan was by far the largest donor with 124 airlift missions bought from other nations at an estimated worth of $46.9 million. (See "Allied Support of US Airlift," Chapter III.) As outlined in Table VII-6, South Korea, Japan, Kuwait, and Denmark contributed 1,511 sea days of sealift worth an estimated $72.1 million. Japan again led the group with donations of nearly $35 million worth of sealift. Kuwait's contribution was especially noteworthy during the surge deployment for war between January and March. During that period, Kuwait donated 505 sea days worth an estimated $15.3 million. Likewise, MSC's Commander, Navy Vice Admiral Francis R. Donovan, considered Denmark's Maersk line donations of the garage deck space on the *Arnold Maersk*

TABLE VII-5

DESERT SHIELD/DESERT STORM DONATED AIRLIFT BY COUNTRY (FOREIGN GOVERNMENT VALUE)

(As of 31 March 1991)

	SEP 90	OCT 90	NOV 90	DEC 90	JAN 91	FEB 91	MAR 91	TOTAL
S. KOREA								
Missions	3	6	7	8	6	11	13	54
Dollar Value	1,350,000	2,700,000	3,150,000	3,600,000	2,700,000	4,950,000	6,750,000	25,200,000
JAPAN								
Missions	3	13	13*	12	15	20	48	124
Dollar Value	1,374,000	5,954,000	6,464,000	5,496,000	6,737,000	5,928,333	14,940,000	46,893,333
KUWAIT								
Missions	1	--	--	--	--	--	--	1
Dollar Value	260,646	--	--	--	--	--	--	260,646
ITALY								
Missions	--	--	--	--	--	12	9	21
Dollar Value	--	--	--	--	--	790,284	701,892	1,492,176
TOTAL								
Missions	7	19	20*	20	21	43	70	200
Dollar Value	2,984,646	8,654,000	9,614,000	9,096,000	9,437,000	11,668,617	22,391,892	73,846,155

*Includes 5 missions performed by the government of Japan outside the MAC arena. Japan flew its own cargo into the AOR.
SOURCE: US Transportation Command Comptroller Donated Lift Reports.

TABLE VII-6

DESERT SHIELD/DESERT STORM DONATED SEALIFT BY COUNTRY (FOREIGN GOVERNMENT VALUE)

(As of 31 March 1991)

	SEP 90	OCT 90	NOV 90	DEC 90	JAN 91	FEB 91	MAR 91	TOTAL
S. KOREA								
Sea Days	17	31	30	60	62	77	93	370
Dollar Value	809,090	809,090	809,090	1,659,090	1,659,090	2,425,757	2,425,757	10,596,964
JAPAN								
Sea Days	--	61	90	92	93	84	--	420
Dollar Value	1,745,000	6,010,555	5,816,667	6,010,555	6,010,555	5,428,889	3,877,779	34,900,000
KUWAIT								
Sea Days	32	62	60	62	155	172	178	721
Dollar Value	865,200	1,500,400	1,452,000	1,500,400	4,755,400	5,236,000	5,319,600	20,629,000
DENMARK								
Sea Days	--	*	*	--	--	--	*	*
Dollar Value	--	788,400	213,800	--	--	--	4,942,931	5,945,131
TOTAL								
Sea Days	49	154	180	214	310	333	271	1,511
Dollar Value	3,419,290	9,108,445	8,291,557	9,170,045	12,425,045	13,090,646	16,566,067	72,071,095

* Space available on ships
SOURCE: US Transportation Command Comptroller Donated Lift Reports.

and *Albert Maersk* for the 1st Corps Support Command unit equipment to be "tremendously helpful" to the nation because they came at "critical moments" during the Phase I deployment.[15]

Of all the Desert Shield/Desert Storm accounting issues, those involving free fuel were the most challenging for USTRANSCOM. Under the Implementation Plan for Logistics Support of US Forces in Defense of the Kingdom of Saudi Arabia, referred to as the Logistics Support Agreement (LSA), signed by the US government and the Saudi Arabian government on 10 November 1990, the Saudis agreed to provide free fuel to US Desert Shield forces operating in Saudi Arabia and its surrounding waters. The agreement covered transient aircraft, such as those in the Civil Reserve Air Fleet (CRAF), as well as those stationed in country. It included all types of fuel and additives and provided for delivery of petroleum, oil, and lubricants to the airfields and aircraft. Under LSA, the Saudi Arabian Marketing and Refining Company (SAMAREC) agreed to provide the fuel either directly or through subcontractors.[16]

Receiving free fuel via the LSA created a series of administrative complications. For example, SAMAREC continued to bill CRAF aircraft for fuel even though under the agreement it should have been free. In response, United States Central Command (USCENTCOM) asked USTRANSCOM to collect paid invoices and then forward them to USCENTCOM for presentation to the Saudi Arabian government for reimbursement.[17] Additionally, in an effort to alleviate the billing problem, the Joint Chiefs of Staff tasked USTRANSCOM to provide CRAF crews with forms that would identify and authorize them to receive free fuel.[18] The Principal Deputy, Office of the Secretary of Defense (OSD) Comptroller, enacted a follow-on measure that reclaimed the value of the free fuel and allocated it back to USTRANSCOM customers by identifying it as specific dollars returned to OSD accounts. The accounts were then returned to the services in a supplemental Desert Storm appropriation.[19] By war's end, CRAF aircraft were usually receiving free fuel, but many of the improperly billed invoices were still outstanding.[20]

SECURITY

Overview. During Desert Shield/Desert Storm, USTRANSCOM and its component commands sought ways to tighten security. Early in the operation, USTRANSCOM's Office of Security expanded security awareness training and continued to emphasize security issues throughout the deployment.[21] Its ongoing evaluation of the commands' security posture paid special attention to unique, one-of-a-kind assets, such as computer data bases, and soft targets, like housing areas, shopping centers, hospitals, and schools.[22] Just prior to Desert Storm, at the recommendation of the command's security specialists, the USTRANSCOM Deputy Commander in Chief (DCINC), Navy Vice Admiral Paul D. Butcher,

ordered the component commanders to institute threat condition Alpha at their facilities worldwide.[23]

Overland and Port Operations. Seaports in the United States were among the most critical nodes in the transportation network. As in past contingencies, MTMC, at the beginning of Desert Shield/Desert Storm, contracted for port security forces and augmented them with its reserve Port Security Detachments (PSDs) composed of military police with a dedicated port security mission. Eventually, MTMC activated all three of its Port Security Detachments for the operation. Additionally, the US Army and US Marine Corps contributed forces for port perimeter, staging area, pier, and gate security duty. Troops forming security zones around ships in port were authorized to use deadly force. MTMC worked with port authorities to upgrade pass systems, including increased use of color coded badges, access lists, and vehicle entry stickers.[24]

The command coordinated its efforts on shore with those of the US Coast Guard, which was responsible for water security at ports in the United States. In addition, the Coast Guard sent Captain of the Port Explosive Loading Teams to US seaports of embarkation to oversee shipment of ammunition. In mid-January 1991, it implemented emergency security zone rules, citing the ports of Los Angeles/Long Beach, California, and the Upper Bay of the New York Harbor of Bayonne, New Jersey, as Security Zones. Under the action, certain areas within the facilities could not be entered unless so authorized by the Captain of the Port. Through the National Port Readiness Network (NPRN),* the Coast Guard worked with port communities, MTMC, port authorities, and other agencies on contingency plans and response guidelines.[25] The Maritime Administration (MARAD), another Department of Transportation (DOT) agency, used the NPRN to provide classified phone systems to the six major commercial ports supporting Desert Shield/Desert Storm: Beaumont, Texas; Houston, Texas; Jacksonville, Florida; Savannah, Georgia; Charleston, South Carolina; and Wilmington, North Carolina.[26]

One of the most likely terrorist targets was MTMC's Military Ocean Terminal, Sunny Point (MOTSU), North Carolina. The largest ammunition port in the US--11,000 acres, 100 miles of railroad track, and three wharves with six berths--MOTSU was the only US terminal capable of loading containerized ammunition. MTMC PSDs--the 4249th from Pocahontas, Iowa, and the 6632d from Los Alamitos, California--conducted traffic control, vehicle inspections, convoy escorts, and patrols of wharf areas at MOTSU. With local authorities, the PSDs formed night vision-capable security units to patrol rail lines leading to the

*A mechanism established by the DOT and Department of Defense (DOD) to coordinate port policy at the national level and among the departments and port officials at the local level. Even without an explicit wartime mission, NPRN facilitated communication among its members during the operation. NPRN representatives: Coast Guard and MARAD for DOT; and MTMC, MSC, Naval Control of Shipping, Maritime Defense Zone, and Army Corps of Engineers for DOD.

critical installation. As extra security for ammunition loading operations during surge deployment, USTRANSCOM directed MTMC to arrange with the Civil Air Patrol (CAP) for air surveillance of MOTSU. Between 11 February and 15 March 1991, a single propeller CAP plane patrolled above the terminal and adjacent areas for four hours daily. On board was a MTMC Physical Security noncommissioned officer. The patrol found nothing to report.[27]

There was a serious security breach in the United States. In early September, security guards working for Union Pacific at the Port of Houston discovered that someone had broken into a container shipped by rail from Fort Sill, Oklahoma. Missing were 7 M-60 machine guns, 33 M-16A1 rifles, and 14 .50 caliber machine guns. Those weapons and other items were later recovered.[28] Such security problems led USTRANSCOM and MTMC to conclude that they relied too heavily on contract guards to police rail yards and ports, in particular MOTSU. Contract guards were expensive, especially considering their lack of training and poor reliability in comparison to their military counterparts. The commands would in the future use military security forces whenever possible.[29]

Additionally, USTRANSCOM's Navy component, Military Sealift Command, sought ways to improve port security based on its Desert Shield/Storm experience. Citing confusion at the Port of Houston over who--MSC, Army, or Coast Guard--was responsible for security, MSC recommended to USTRANSCOM that port contingency plans fix more precisely agency security roles in the water, on ship, and on shore. In general, MSC wanted port readiness committees "to learn from Desert Shield and work to identify security shortfalls, eliminate security overlaps, and enable smooth communications and cooperation among all civil/military agencies, commercial facilities and ships."[30]

Overseas, where US Forces for the most part had to depend on the host government for security, there were bomb threats and actual attacks against MTMC. While loading the *American Shakti* at Bremerhaven's Emden Terminal on 11 February, port authorities received a call stating a bomb in the ship's number two hold would go off in 45 minutes. Local police evacuated the port, searched the vessel, and found nothing.[31] On 21 January, a bomb exploded during non-working hours at the MTMC Outport Headquarters building in Istanbul, Turkey, as the facility's Turkish police guards changed shifts. A government vehicle was damaged, three portable buildings were destroyed, and all the glass in the main building was broken. No one was injured and no one claimed responsibility.[32] Four other bomb attacks early in the year, two each at MTMC Terminals Izmir and Iskenderun, Turkey, also caused damage, but no injuries. (The Turkish terrorist group Dev Sol claimed responsibility for the Iskenderun incidents.) MTMC terminal commanders in Turkey countered with 24-hour security patrols and issue of soft body armor. Workers were instructed to wear civilian clothes and drive unmarked and locally licensed vehicles. In Turkey and elsewhere overseas, the command's employees varied their routines

and routes to and from work.[33] Finally, United States and host nation forces at ports in northern Europe routinely conducted underwater sweeps of piers and ships.[34]

Airlift. Obvious terrorist targets were aircraft and airports. During the deployment, USTRANSCOM, through its Air Force component, Military Airlift Command, reinforced already stringent flightline security procedures at MAC bases. MAC augmented its six US-based aerial port squadrons with security police from its Associate Reserve Flights. It also strengthened ties with the Air Force Office of Special Investigation and local police forces. Overseas, Germany's civilian and military police helped guarantee the security of Frankfurt International Airport, Germany, and the adjoining military air base of Rhein-Main, two of the highest threat locations. At Ramstein Air Base (AB), Germany, another high threat target and crucial en route location for MAC, United States Air Forces Europe (USAFE) security forces guarded airlift aircraft and crews.[35]

MAC police increased security at its bases in a variety of ways. In the United States and overseas, the command expanded the use of X-ray machines. At Rhein-Main, MAC installed thermal imagery equipment to help protect C-5 aircraft parked overnight at the extreme ends of the ramp. When it received a call that bombs had been planted on trucks carrying cargo from Pennsylvania to Dover Air Force Base (AFB), MAC sent additional explosive detection dogs to its Delaware base. The call proved to be a hoax perpetrated as part of a labor dispute. At Dover, a key link in the air route to the Persian Gulf, MAC requested Delaware State Police to patrol the base's perimeter and surrounding area. Twice each day in January, the Delaware State Police flew helicopter surveillance missions to ensure the safe passage of aircraft fuel traveling the intracoastal waterway via barge to Dover. At the request of USTRANSCOM's Office of Security, the Coast Guard stepped up patrols along the Delaware shore. In general, MAC and USTRANSCOM sought to increase the visibility of security at bases worldwide.[36]

DOD worked closely with the Federal Aviation Administration (FAA) to safeguard civilian and military passengers. For instance, MAC coordinated with the FAA on its initiatives to discontinue curbside baggage check-in; tow away unattended vehicles; confiscate unattended baggage; limit access to terminal gate areas to ticketed passengers only; and increase searches of trash receptacles and public areas, such as restrooms and lounges. MAC and FAA security specialists also met frequently to discuss their concerns and refine procedures to help avoid security breaches like two documented early in the deployment: NBC anchor Sam Donaldson boarded a CRAF aircraft in Saudi Arabia to interview its crew even though the aircraft and the crew were by security regulation off limits to the press, and *USA Today* published photographs of an airfield in USCENTCOM's AOR taken by a World Airways copilot against security instructions.[37]

The FAA, DOD, and US Postal Service coordinated their efforts to ensure that terrorists could not use the military postal system to place bombs aboard US air carriers. Following Postal Service guidance, military base commanders strictly enforced identification checks of personnel, in uniform or not, who mailed parcels; expanded mail bomb detection training for personnel handling parcels; and removed mail collection boxes or modified their openings to accept only normal, flat letters.[38] In December, when the FAA informed USTRANSCOM that it could not move the huge backlog of packages through security checks at Dulles International Airport* fast enough to reach the troops before Christmas, the command's Chief of Security, Air Force Colonel David M. Southworth, arranged with the Postal Service, FAA, and MTMC to move it by truck to McGuire AFB, New Jersey. There, Colonel Southworth stationed additional explosive detection dogs for round-the-clock, seven-days-a-week duty to check packages being transferred from trucks to MAC aircraft. As a result, the command delivered the holiday cargo safely and on time to the troops in the AOR.[39] At the outbreak of hostilities in mid-January, USTRANSCOM supported FAA efforts to enforce new inspection regulations for air carriers at "extraordinary security airports"--those in Egypt, India, Israel, Pakistan, Philippines, Saudi Arabia, Thailand, Tunisia, Turkey, and almost every European country (Germany was a notable exception). All non-letter US military mail was subjected to one or more of the following security controls before being placed aboard aircraft carrying passengers: X-ray, DOD-approved explosive canine inspection, or FAA-certified explosive detection system.[40]

Sealift. USTRANSCOM worked closely with MSC and the Maritime Administration (MARAD) to ensure the security of ships at sea. MSC expanded its shipboard security engagement tactics training program by sending Naval Investigative Service mobile training teams to ships deploying for Desert Shield/Desert Storm. To guard cargo and prevent pilferage, the command authorized US soldiers, sailors, and marines to travel onboard deploying ships. Frequent reporting requirements for ships' masters en route to the Persian Gulf helped the command more precisely track and thus safeguard ships and their cargo. According to MSC's Commander, Vice Admiral Francis R. Donovan, "Once our ships entered an area of concern--the Red Sea for example--the Navy knew who was coming and when they were coming. And every one of those ships--US flag or foreign flag--was being monitored carefully" by the US Navy and coalition navies nearby. He felt sure that he, the ships' masters, and friendly forces "always had a good feel for whatever the threat condition was."[41] Similarly, MARAD increased position reporting frequency for US flag merchant ships in the Mediterranean, Red Sea, and Persian Gulf from once every 48 hours to once every 12 hours. It also issued to masters and operators of US flag and US-owned foreign flag merchant vessels detailed instructions on how to avoid

*An eastern area collection point for military mail during Desert Shield/Desert Storm. See "Mail, Gifts, and Channel Airlift," Chapter III.

and counter terrorist attacks.[42] As a result, shipping lines tightened security. For instance, Crowley Maritime doubled the watch on its vessels, increased ship lighting, and charged fire hoses to repel boarders. Although there were no confirmed terrorist attacks against US shipping companies during Desert Shield/Desert Storm, shipping executives speculated that a pro-Iraqi, anti-American group was responsible for an unsuccessful attempt to burn down the offices of the South Europe-United States of America Freight Conference in Genoa, Italy. Two US shipping lines making large contributions to the allied effort, Lykes Brothers Steamship Company and Sea-Land Service, were conference members.[43]

DOD was especially concerned that choke points like the Suez Canal not become blocked. To help protect the canal against sabotage during the deployment, Egypt posted guards every kilometer along the 105-mile passage. It also assembled a fleet of ships that included floating cranes, digging equipment, and special vessels capable of towing large tankers and cargo ships should they become disabled. A 100-man diver and engineer rescue team specialized in removal of obstructions and mines.[44]

The Suez Canal Authority paid special attention to bulk cement and explosives carriers which, if sunk, could delay or stop the flow of oil north and the transit of Desert Shield/Desert Storm cargo south. It scrutinized the documentation, ownership, and itineraries of such ships, and Egyptian intelligence interviewed their officers and crew members. Ships under suspicion faced more drastic preventative measures. For example, when Egyptian authorities discovered that the Qatari flag, Kuwaiti-based, United Arab Shipping Company-owned vessel *Fathulkair* carried high explosives and military hardware not listed on its manifest, they ordered it to unload the explosives prior to entering the canal. Trucks moved the hazardous cargo overland and then stevedores reloaded it aboard the vessel once it had cleared the canal zone.[45]

Early in the deployment, masters of US flag ships complained of "large numbers of canal officials boarding vessels expecting gratuities." Failure to pay them off "subjected the vessels to trumped up fines and delays." At times, canal officials ordered masters who refused to pay the bribes to move their ships to congested shallow draft anchorages, which increased the threat of accidents and unauthorized boardings. At MSC's urging, the United States Defense Attaché Office in Cairo corrected the problem.[46]

Emphasis on prevention limited the number of security incidents against ships at sea during Desert Shield/Desert Storm. MSC reported to USTRANSCOM only one act of pilferage--audio tapes stolen from a truck aboard the Fast Sealift Ship *Pollux*--in the entire operation. In another incident, the MSC-chartered, United Arab Emirates flag ship *Trident Arrow* on 4 October was rammed by an unidentified vessel near Dover, England. Although not part of the Desert Shield

deployment, the incident was followed closely by USTRANSCOM and MSC Crisis Action Teams, who feared it might be a precursor to terrorist acts against ships supporting US operations in the Persian Gulf. In fact, the ship's captain, a Pakistani, termed the incident "sabotage." Carrying military cargo, including 85 M1A1 tanks, from Bremerhaven, Germany, the *Trident Arrow*, slightly damaged, continued its voyage to Livorno, Italy.[47]

The next leg of her voyage was equally eventful. Later on the 4th, following the ramming incident, the US Army lieutenant commanding the ten-member military police escort team onboard to guard the tanks, reported hearing gun shots fired and smelling the odor of gun powder. Based on circumstantial evidence and comments overheard from Pakistani crewmembers, the lieutenant reported to his superiors at US Army Europe on 6 October that the crew, perhaps with the captain's support, was plotting to seize the ship. Upon receiving this information, MSC, with USTRANSCOM's concurrence, contacted the *Trident Arrow's* owner and directed him to order the ship to Rota, Spain. When the ship reached the Spanish port on the 7th, it was met by a US Navy captain who, after interviewing the ship's captain and the crew, determined that there was no threat to the ship or its cargo. After replacing the escort team with another commanded by an Army captain, the *Trident Arrow* completed its voyage without further trouble. As a result of the *Trident Arrow* incident, MSC recommended to USTRANSCOM that "CO [commanding officer] of embarked units coordinate resolution of reported incidents with the vessel master prior to taking independent actions." In other words, MSC concluded that the lieutenant had overreacted and thus delayed delivery of the ship's cargo.[48]

Although there were no acts of piracy against US or foreign flag ships under contract to MSC during Desert Shield/Desert Storm (there were five acts of piracy against MSC-contracted ships just prior to and shortly after the operation), USTRANSCOM and MSC had good reason to believe there might be. Rare prior to Iraq's invasion of Kuwait, piracy in the Persian Gulf increased during the crisis, when masters on several freighters reported boardings and robberies by masked gunmen. Intelligence experts theorized that the pirates were foreign nationals who had been working in Kuwait. Displaced by the Iraqis, jobless, and unable to return to their homelands, they turned to piracy.[49]

Recent incidents of piracy in the Red Sea against foreign flag ships also put the commands on guard. The pirates' normal modus operandi was to attack merchant vessels in speed boats while firing machine guns and rockets. They would then board the ships and rob them and the crews. Arms, food, and medical supplies were especially prized. They would also detain the ships, sometimes for days. In September 1990 they grounded and burned one. Because the targets were usually from Eastern European countries--Poland, East Germany, Yugoslavia, and the Soviet Union--intelligence analysts believed the pirates were Ethiopian rebels bent on bringing down the communist regime in

Ethiopia.[50] Consequently, USTRANSCOM and MSC followed closely the transit of the Yugoslavia flag ship *Jurina*, under contract to MSC and carrying Desert Shield/Desert Storm cargo, through the Red Sea. Knowledge of *Jurina*'s previous trip to the region in September 1990 only served to heighten the commands' concern: the ship's crew claimed to have been robbed by Ethiopian pirates on that voyage. According to the ship's owners, the pirates told the captain that "this attack was the last warning to Yugoslav ships" and that the next one they caught they would "sink without warning."[51]

Fortunately, the *Jurina* completed its voyage safely. It departed Jacksonville, Florida, on 8 December 1990 carrying nearly 1,500 tons of combat service support cargo to Ad Damman, Saudi Arabia. Transiting the Red Sea the first week of January 1991, it hugged the Saudi Arabian coast to minimize the possibility of contact with Ethiopian pirates operating from bases in Ethiopia and Sudan to the south. US Navy vessels in the area kept a close watch on her. On board the *Jurina*, US Army guards remained on alert, and at USTRANSCOM, General Johnson monitored the ship's progress daily via his Joint Visual Information Display System. He also received from his intelligence analysts updates on threats in the Red Sea region.[52]

Although the threat from piracy in the Red Sea and Persian Gulf remained low through the end of the deployment, based on recent intelligence analysis it likely would increase worldwide in the years to come. In fact, MSC predicted that the "threat of piracy on US and foreign merchant vessels" would be its greatest security-related problem in the post-war era. Of particular concern to the United States and other maritime trading nations was the Strait of Malacca joining the Indian Ocean and the South China Sea.[53]

The command outlined a few ways it could improve security for commercial vessels. MSC determined that in many cases masters of foreign flag ships under charter to it during Desert Shield/Desert Storm could not read English and thus could not understand security instructions provided to them by ship owners and operators. Consequently, MSC would provide each foreign flag vessels with such information in the master's language. Additionally, the command would compile lists of local interpreters to provide security briefings to foreign flag crews prior to sailings. Beyond that there was not much MSC could do other than strictly enforce already stringent security regulations and reporting requirements for its chartered vessels.[54]

Conclusion. For USTRANSCOM and its component commands' security police forces, one lesson stood out among all others in the Desert Shield/Desert Storm experience: a key to security was communication and coordination with their military and civilian counterparts in the United States and overseas, and with US federal agencies like the FAA, Coast Guard, and Postal Service. As a result of such international, interagency cooperation, the United States and its allies, for

the most part, avoided serious security incidents at their transportation facilities during Desert Shield/Desert Storm. Likewise, vigilance, foresight, and initiative on the part of the commands' security police helped protect transporters and their assets from terrorists, saboteurs, and other such threats in the United States and overseas during the operation. Finally, the commands' security forces, like its operators and logisticians, needed accurate and timely intelligence.

INTELLIGENCE

Activated in December 1989, the Joint Transportation Intelligence Center (JTIC) was USTRANSCOM's principal intelligence source during Desert Shield/Desert Storm. For the first several weeks of the crisis, the USTRANSCOM CAT had difficulty finding detailed information on primary and secondary airports and seaports in the AOR. Intelligence was often dated or contradictory and was rarely tailored to the transporters' needs. To fill the vacuum, the JTIC--aided by the command's Central Intelligence Agency, Defense Intelligence Agency, and National Security Agency liaison officers--provided reports on and imagery of transportation facilities on the Arabian Peninsula. It helped the CAT determine seaport throughput capabilities and flow rates for military and civilian aircraft, and select embarkation, debarkation, and transfer points.[55] Furthermore, the JTIC augmented the MTMC staff with two intelligence officers early in the deployment, and provided MSC warning advisories so that ship masters could avoid threats to their vessels.[56]

The USTRANSCOM CAT found JTIC products particularly useful in "what if" scenarios. Working with JTIC threat analyses, for example, the Plans and Analysis Cell simulated the impact on force closures should the United States be denied use of the Suez Canal. Likewise, the Medical Cell came to rely on JTIC data for health care, disease control, and aeromedical airlift evacuation planning.[57]

The command's intelligence specialists also assisted planners, operators, and logisticians intheater. USTRANSCOM intelligence studies on terrain composition, drainage, vegetation, road networks, and trucking capability in Saudi Arabia and Turkey contributed to the rapid success of allied operations. Additionally, the Commanders in Chief, US Central Command (USCINCCENT) and US Transportation Command (USCINCTRANS) used JTIC imagery and analysis to determine that off-shore oil spills would not delay port operations. After the war, JTIC-provided imagery of Kuwait International Airport assisted US forces in using that facility in transportation and refueling operations.[58]

USTRANSCOM intelligence specialists learned several lessons from their participation in Desert Shield/Desert Storm. Early and close coordination with their counterparts at the other unified commands was the only way to ensure collection and production of intelligence required by transporters as they moved

from one commander in chief's (CINC's) area of responsibility to another. Stationing transportation intelligence analysts at en route stations to brief military and commercial contract aircrews on the latest threats in the AOR should be standard procedure for future contingencies. In fact, USTRANSCOM's Deputy Director of Intelligence, Mr. Thomas S. Reynolds, considered the sharing of secret information with commercial aircrews, the Airline Pilots Association, and airlines under contract to MAC (a first during Desert Shield/Desert Storm) to be one of the best intelligence-related decisions the command made during the operation. He also praised the support the JTIC received from reservists, but recommended that in the future they be better prepared to deploy; in particular, USTRANSCOM and MAC needed to make sure their intelligence reservists received recurring chemical warfare ensemble and 9mm arms training.[59]

One of the greatest problems for intelligence analysts in USTRANSCOM was poorly integrated command, control, and communications intelligence (C3I) systems. They found it extremely difficult to pass intelligence between CINCs and from USCINCTRANS to deployed forces. According to the JTIC, the Joint Chiefs of Staff (JCS) should make the integration of C3I systems one of its highest priorities. Such systems also needed to be deployable, the command's intelligence specialists emphasized.[60]

Based on their Desert Shield/Desert Storm experiences, USTRANSCOM CAT members recommended ways the JTIC could improve its services. During the operation, imagery tended to be too narrow and limited in scope, operators and logisticians concluded. Consequently, they asked the JTIC to provide them with broader swath and littoral imagery of coastal areas, airports, and seaports. Of equal importance, according to a USTRANSCOM CAT executive officer during Desert Shield/Desert Storm, the JTIC needed to be more aggressive in making transportation intelligence requirements known to the regional commanders in chief and the national intelligence community so that they could make available to the command such information early in the next contingency.[61]

CAT members especially needed the national intelligence community, perhaps through the JTIC, to compile for the command a Worldwide Port Capabilities Data Base that it could tap for current airport and seaport characteristics. For seaports the data bank needed to include, for example, the number of piers and their lengths, pier side and channel drafts, and crane types. Airport navigational aids and runway and taxiway lengths, widths, and weight bearing capability were required. Necessary also were up-to-date fuel and maintenance capabilities at ports, air and sea.[62]

Several former Desert Shield/Desert Storm CAT members recommended that the nation's intelligence experts appoint data base managers dedicated to keeping the ports file current. The technicians should begin by combining MAC, MSC, and

MTMC ports data into the USTRANSCOM Port Capabilities Data Base for use by all the four commands' operators, logisticians, and intelligence analysts. Next they should make current information on facilities overseas. Obviously, the Desert Shield/Desert Storm operation offered a rare opportunity to update Saudi Arabia and other Persian Gulf port files with data collected intheater from human intelligence sources and through debriefings of air and sea crews. Eventually operators and logisticians at USTRANSCOM would need to consult the command's Port Capabilities Data Base for information on ports in the United States.[63]

Finally, many in the command considered JTIC products in support of the deployment to be "too blue." Primarily formed around a nucleus of Air Force officers and civilians from MAC, the JTIC at the beginning of Desert Shield/Desert Storm was understandably airlift oriented. As the operation progressed, however, the JTIC expanded its expertise in sealift and landlift, a trend that CAT members--operators, logisticians, and intelligence analysts alike--applauded and expected to continue.[64]

HISTORIAN

At the outset of Desert Shield, the USTRANSCOM History Office made collection and preservation of documents dealing with the command's activities during the contingency its highest priority. It arranged with the CAT Administrative Cell to receive on a daily basis copies of significant incoming and outgoing messages, including USTRANSCOM, MAC, MSC, and MTMC situation reports. These the History Office accessioned and indexed by subject throughout the operation. The historians also used them to compile an ongoing operational chronology. With the CAT Directors' assistance, they set up a system for packaging and storing CAT operational files (by the end of Desert Storm, the collection numbered 160 boxes) until they could screen and catalog them for the archives. In this way, they helped ensure that the documents were not shredded or otherwise disposed of without their knowledge and sanction. Furthermore, the History Office earmarked, for permanent retention in the archives, unique primary sources such as CAT logs, journals, and notes.

Establishing the historians' positions as CAT team members was critical to performing the historical function. Soon after CAT activation, USTRANSCOM historians began collecting documents in the CAT, taking notes at CAT briefings for the CINC and Deputy CINC, and conducting interviews with CAT members. All CAT members needed to know who the historians were. That meant the historians worked some nights and weekends. The historians found ways to help CAT members do their jobs, often giving them advice and guidance. Only as active and credible CAT team players did the historians gain access to the information they needed to document and write the history of the deployment.

Dr. James K. Matthews, the Command Historian at USTRANSCOM, also considered teamwork among historians to be a key to success. Early on, the USTRANSCOM History Office formed a Desert Shield Historical Team composed of the two USTRANSCOM historians, the MAC Deputy Command Historian, the MTMC Command Historian, the Inspector General at MSC (that command had no permanent historian), and two US Naval Reserve officers from USTRANSCOM Naval Reserve Detachment 118. Team members established goals and deadlines for publication of Desert Shield/Desert Storm document indexes, chronologies, special studies, and monographs. Together they helped ensure document collection was complete and that their offices avoided duplication of effort. In that vein, during the operation Dr. Matthews visited a number of DOD history offices--JCS, services, and US Central Command--to keep them apprised of the USTRANSCOM history team actions and help coordinate the overall DOD Desert Shield/Desert Storm historical project.

Perhaps the History Office's most important contribution to the operation was in the area of strategic lift statistics. Throughout Desert Shield/Desert Storm, the office, by order of USCINCTRANS, served as DOD's single-point-of contact for such information. On a regular, almost daily basis, it collected, tabulated, analyzed, and disseminated to a wide variety of customers--DOD, Joint Staff, services, unified commands, and Department of Transportation--the total number of missions flown, shiploads delivered, and cargo and passengers carried to the Persian Gulf. (See the tables and appendices in this history.) Thus General Johnson and other interested parties received accurate, authoritative, current, and consistent lift numbers. In fact, USCINCTRANS relied on the USTRANSCOM History Office's lift statistics for his congressional testimony and his Desert Shield/Desert Storm status reports to the Secretary of Defense Richard B. "Dick" Cheney, Joint Chiefs of Staff Chairman Army General Colin L. Powell, and USCINCCENT Army General H. Norman Schwarzkopf. They also appeared in DOD Inspector General and General Accounting Office reports on USTRANSCOM and would serve as a basis for postwar operational planning, policy formulation, and decision making.[65]

PUBLIC AFFAIRS

The US military, from the Secretary of Defense on down, recognized early in the deployment the key role USTRANSCOM could play in gaining and keeping public support for the operation. During the first few weeks of Desert Shield, the nation's citizens showed intense interest in the deployment, but DOD was reluctant to release much information for fear it might give an advantage to Saddam Hussein. Once forces were well underway and positioning themselves in Saudi Arabia, however, DOD began to ease censorship and it turned to General Johnson to give its first substantive, detailed press conference on Desert Shield. On Tuesday, 21 August 1990, USCINCTRANS revealed to Americans the gigantic deployment underway. "To give you a feel," he stated "we've moved, in

essence, a midwestern town on the size of Fayette, Indiana, or Jefferson City, Missouri...the equivalent to all their cars, trucks, foodstuffs, stocks, household goods, and water supply." In weight, he added, it equaled 400,000 automobiles. Throughout the 45-minute briefing and question and answer period, General Johnson emphasized the contribution of the total force--active, reserve, and civil sector--and the interrelationship of the nation's transportation assets: airlift, sealift, trucks, trains, and air and sea ports. For the first time ever, many Americans heard terms like Fast Sealift Ships, Ready Reserve Force, and Civil Reserve Air Fleet. He introduced them to strategic deployment issues such as aerial refueling, diplomatic clearances, airframe stress, crew rest, aeromedical evacuation, afloat prepositioning, and the union call for merchant mariners and their patriotic response. The entire effort, General Johnson stressed, "is something we as Americans can be proud of."[66]

His talk, heard around the world on Cable News Network (CNN), had value beyond that of rallying public support for the operation. The DOD believed it helped deter Saddam Hussein and others who might contemplate emulating him: after hearing about such a massive mobilization and deployment, who could doubt America's commitment? In fact, that was why the first Desert Shield videos carried by the networks showed strategic airlift aircraft offloading in Saudi Arabia. Such pictures were both dramatic and subliminal. The vision of whale-like C-5 Galaxy's, their huge "mouths" open and their cavernous "bellies" disgorging hundreds of US troops and equipment to do battle with Iraq, will be forever etched in our minds and those of our potential adversaries.

Based on his Desert Shield/Desert Storm experience, USTRANSCOM's Chief of Public Affairs, Air Force Colonel Cecil "Bud" F. Ross, noted several ways he and his colleagues in DOD could improve their services. He believed that in future contingencies USTRANSCOM should exploit, for both its public relations and deterrent impact, the image of Fast Sealift Ships loading and unloading tanks, helicopters, and other high-tech military equipment. The Air Force's Combat Camera teams accumulated "a lot of high quality stills and videos of operations in the desert," but DOD "had a feeble mechanism for clearing them for public release," according to Colonel Ross who personally went to the Pentagon "several times to try to break the logjam" for internal release. He noted that "even the Air Staff's Office of Public Affairs could not get Combat Camera products cleared in a timely manner." Following the operation, Colonel Ross and other DOD public affairs specialists recommended that the JCS make it the supported CINC's responsibility to clear, intheater, Combat Camera products for wider public and internal release. Additionally, he wanted to see the Combat Camera function become a joint activity realigned from the Air Force to DOD's Office of Public Affairs. He also emphasized the need for USTRANSCOM and its component commands to maintain the deployment readiness of their public affairs specialists. Although early deployment of the commands' public affairs officers to Saudi Arabia and various locations across the United States facilitated

timely and accurate reporting on transportation's role in the war effort, Desert Storm showed once again that stories on transportation and other logistics activities hold little interest once the shooting starts. More to the point for USTRANSCOM, its news worthiness was early in the operation and short lived.[67]

Desert Shield/Desert Storm helped bring to maturity USTRANSCOM's philosophy that the best way to tell the command's story and garner grassroots support was through local media. Reports by local journalists--for example, Marines boarding C-5s at March AFB, California, rail cars carrying tanks along Interstate Highways 64 and 80, truck convoys nearing the Port of Beaumont, Texas, or ships loading cargo at Bayonne, New Jersey; Savannah, Georgia; and Oakland, California--were often picked up by national news broadcasting station affiliates from Los Angeles to New York. In this way, millions of Americans across the nation learned about USTRANSCOM. Furthermore, because the stories were about "hometown folks" they were, according to Colonel Ross, "most always positive and unfiltered by the networks and national print media."[68]

The command encouraged newspaper and journal coverage. During the operation, General Johnson granted interviews to the *St. Louis Post-Dispatch*, *Journal of Commerce*, *Jane's Defence Weekly*, *Boston Herald*, *Los Angeles Times*, and *Washington Post*, just to name a few. Other senior USTRANSCOM officers were equally generous with their time. In fact, the USTRANSCOM Office of Public Affairs' digest *Desert Storm: USTRANSCOM in the News* includes nearly 120 published interviews and articles, several of which were written by noted transportation experts. The compendium attests to the command's success in getting its story told during the operation.[69] Most importantly, the depth and breadth of print media and video reporting on USTRANSCOM's role in Desert Shield/Desert Storm helped educate the public on the crucial role of strategic mobility in national defense and galvanize support among the country's leadership for improving the Defense Transportation System.[70]

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C-17 Globemaster III

CONCLUSION

One of the largest deployments in history, Desert Shield/Desert Storm had much to teach transporters and those who rely on the Defense Transportation System (DTS). The Civil Reserve Air Fleet (CRAF), afloat prepositioning, overland transportation, port operations, strategic airlift (organic and commercial), strategic sealift (especially fast sealift) and the Ready Reserve Force (RRF), once activated, worked extremely well. Operations like Desert Express and Special Middle East Sealift Agreement (SMESA) should be considered for future contingencies. The war highlighted the tremendous capability of Roll-On/Roll-Off (RO/RO) vessels. Staging bases in Europe were critical to strategic airlift. The Department of Defense (DOD) needed to renew its planning efforts, support Joint Operation Planning and Execution System (JOPES) improvements, and enforce JOPES training in peacetime so users would be prepared to operate the system in war. The United States Transportation Command (USTRANSCOM) and its component commands needed to push for containerization and intransit visibility in DOD. Desert Shield/Desert Storm convinced USTRANSCOM that with the C-17 aircraft and mix of well-maintained, militarily-useful ships in the RRF and United States flag fleet--supplemented with a Merchant Marine Reserve, increased afloat prepositioning, and procedures for activating reserve transportation units to prime the DTS prior to the 200,000-troop Presidential call-up--the nation would have the strategic deployment force it required.

Desert Shield/Desert Storm underscored the importance of DTS user support for USTRANSCOM roles, responsibilities, and initiatives. The unified commands and the services needed to put strategic mobility programs high on their lists of funding priorities and continue to educate their forces, with USTRANSCOM's assistance, in the operation of the DTS. They could in the future avoid problems encountered during Desert Shield/Desert Storm by ensuring Time Phased Force Deployment Data (TPFDD) currency, validating the TPFDD early in the deployment, freezing the TPFDD periodically throughout the operation, and limiting changes to the TPFDD. For the joint chain of command to maintain visibility over the deployment, they needed to go directly to USTRANSCOM with their lift requirements. Additionally, they could enhance intransit visibility, speed delivery, and avoid backlogs at ports of embarkation and debarkation by following Military Standard Transportation and Movement Procedures, and by establishing airlift cargo allocation and priority systems and adhering to them. Early and accurate requirements forecasting would allow USTRANSCOM to schedule the most appropriate forms of lift against user requirements for force closure and sustainment, as planned. In general, deployment discipline--on the part of the unified commands, services, and other DTS users--would increase effectiveness and improve efficiency.

During Desert Shield/Desert Storm USTRANSCOM proved its value. The Goldwater-Nichols Department of Defense Reorganization Act of 1986 helped to strengthen joint command relationships as well as the role of unified Commanders in Chief (CINCs). Partly as a result of this act, the President established USTRANSCOM in 1987 to provide the CINCs with global air, land, and sea transportation required to meet national security objectives. Acting on this authority during Desert Shield/Desert Storm, USTRANSCOM had the ability to react quickly to changing priorities. In this case, the supported CINC, Army General H. Norman Schwarzkopf, needed to call only one person to satisfy his transportation requirements: USTRANSCOM's Commander in Chief (USCINCTRANS), Air Force General Hansford T. Johnson. Moreover, as a unified CINC, USCINCTRANS worked directly with the other supporting CINCs, the Joint Chiefs of Staff (JCS), and a wide variety of government agencies to facilitate the deployment. With oversight of the entire transportation operation and authority to manage it, USTRANSCOM employed personnel, aircraft, ships, trains, trucks, and port assets to meet the customers' requirements. Despite the success of this arrangement, Desert Shield/Desert Storm reinforced General Johnson's belief that USTRANSCOM was not yet the fully operational, peacetime as well as wartime, common-user transportation manager it needed to be. To smooth the transition from peacetime operations to a wartime footing, USTRANSCOM needed to have the same roles, responsibilities and authority in peace as it had in war.[1]

Joint Staff analysis of the war supported General Johnson's conclusion. Air Force Major General Malcolm B. Armstrong, Special Assistant to the Director of the Joint Staff, in his report "Implications for TRANSCOM Based on Desert Shield Observations," outlined the problem and solution for Army General Colin L. Powell, Chairman, Joint Chiefs of Staff. The peacetime responsibilities of USCINCTRANS, especially in a crisis short of war, exceeded his authority. The USTRANSCOM Implementation Plan, the command's original "charter," defined the command as "wartime oriented." Thus, authorities not granted to USCINCTRANS in peacetime, but necessary to manage a wartime strategic deployment such as Desert Shield, included: (1) operational control of the three component commands; (2) charter to act as the single manager of all lift assets; and (3) charter to be the single traffic manager. To deny USCINCTRANS such authority, General Armstrong insisted,

> risks establishment of deployment priorities and allocation of deployment assets [during war] that neither match the priorities of the supported CINC, nor reflect the optimum use of mobility assets envisioned by [those who formed] TRANSCOM....The observation that we should organize in peacetime as we will fight in wartime--avoiding separate command arrangements for peace and war--strongly applies here.[2]

Furthermore, General Armstrong continued--in a follow-up memo to his boss, Air Force Lieutenant General Michael P. C. Carns, Director of the Joint Staff--USCINCTRANS required

> authority in peacetime day-to-day to direct that MSC, MTMC, and MAC operate and exercise in a manner compatible with the JOPES deployment management system,...to participate in key policy and doctrine formulations that his components establish with their parent Service,...and to see into programs and plans of his components in order to judge the overall balance, appropriateness, and adequacy of lift programs.

For these reasons, and to streamline DOD's transition to war, he concluded that the Secretary of Defense (SECDEF) must "change the existing charter of USCINCTRANS [and provide him] with OPCON [operational control] of the components on a full-time basis--something all other CINCs have."[3]

Generals Carns and Powell and Secretary of Defense Richard B. 'Dick" Cheney agreed with General Armstrong. On 14 February 1992, SECDEF memorandum "Strengthening Department of Defense Transportation Functions" gave USCINCTRANS his new charter.[4] Nicknamed the "Valentine's Day Memo," it was codified in DOD Directive 5158.4, "United States Transportation Command," on 8 January 1993.[5]

Stating the command's mission to be "to provide air, land, and sea transportation for the Department of Defense, both in time of peace and time of war," the charter greatly expanded USCINCTRANS' authorities. Under it, the Service Secretaries assigned the Transportation Component Commands (TCCs)--the Air Force's Military Airlift Command (MAC), the Navy's Military Sealift Command (MSC), and the Army's Military Traffic Management Command (MTMC)--to USCINCTRANS under his combatant command in peace and war. In addition, the military departments assigned to him, under his combatant command, all transportation assets except those that were service-unique or theater-assigned.* (Authority and duty to organize, train, and equip forces for assignment to USCINCTRANS, and the associated programming and budgeting function, remained with the Service Secretaries.) The charter also made USCINCTRANS DOD single-manager for transportation, other than service-unique and theater-assigned transportation assets. He was delegated authority to procure commercial transportation services, including lease of transportation assets, and activate, with SECDEF approval, the CRAF, RRF, and the Sealift Readiness Program

*Examples included Navy ocean survey, hospital, cable, oceanographic research, fleet auxiliary, submarine surveillance, and fleet store ships; service prepositioning ships prior to initial discharge; Air Force search and rescue, weather reconnaissance, audiovisual, and aeromedical evacuation functions; and transportation assets assigned for combatant command to a commander of a unified command other than USCINCTRANS.

(SRP). He also gained control of transportation accounts in the Defense Business Operations Fund (DBOF).[6]

USCINCTRANS' advocacy role expanded under the new charter. By SECDEF order, he needed to make known, to the Service Secretaries and the Under Secretary of Defense for Acquisition, the mobility assets--their capability, capacity, characteristics, and design--he required to execute USTRANSCOM's mission. USCINCTRANS was also required to establish and maintain relationships between DOD and the commercial transportation industry to develop concepts, requirements, and procedures for the Contingency Response Program, the CRAF, and the SRP.[7]

Issuing USTRANSCOM's peacetime, single-manager charter, Secretary Cheney believed, had greatly improved the nation's military posture. "In light of change in the world situations and reduced resources devoted to national defense, the Department of Defense is," he noted, "moving to a smaller, but highly-trained, well-equipped and mobile military force." Consequently, he emphasized, "the national security strategy depends heavily upon our ability to transport personnel and materiel." With its new authorities and organized in peacetime as it would fight in wartime, USTRANSCOM would now be capable of "effectively and efficiently" transporting the nation's military forces into the 21st century.[8]

Chairman visits Scott AFB, Illinois, on 11 July 1991 to thank USTRANSCOM for the Desert Shield/Desert Storm deployment. Left to right: Sgt Christopher S. Coons, USAF, MAC Elite Guard; GEN Colin L. Powell, USA, Chairman of the Joint Chiefs of Staff; Gen Hansford T. Johnson, USAF, USCINCTRANS; LTG James D. Starling, USA, Deputy Commander in Chief USTRANSCOM; and Lt Gen Robert L. Rutherford, Vice Commander, MAC. (Note: General Rutherford became USCINCTRANS on 18 October 1994.)

CONCLUSION NOTES

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3. Memo (U), Maj Gen Malcolm B. Armstrong, USAF, Special Assistant to Lt Gen Michael P. C. Carns, Director Joint Staff, TRANSCOM Authorities, 6 Nov 90.

4. Memo (U), SECDEF to Secretaries of the Military Departments, et al., Strengthening Department of Defense Transportation Functions, 14 Feb 92.

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LIST OF APPENDICES

APPENDIX 1

Consolidation of Transportation in the Department of Defense

World War II: Showed that transportation and other military functions were poorly organized, resulting in overlap and duplication in manpower and assets. Consequently, in 1944 Congress considered establishing a unified armed service. Testimony highlighted the benefits of centralizing military transportation resources and defense traffic management. Service opposition, however, killed the initiative.

National Security Act of 1947: Clarified Congress' intent not to merge the three services into a single organization and directed the Secretary of Defense (SECDEF) to eliminate unnecessary duplication and overlapping in several fields, including transportation. That position led to interdependence of transportation functions and eventually to today's single manager concept.

1949 Hoover Commission: Sharply critical of the lack of coordination in the government supply and transportation functions, it recommended that they be consolidated. It specifically recommended that military transportation be centralized under a National Military Establishment. The result was the creation of the General Services Administration (GSA) with power to establish policy and methods of procurement in the areas of transportation and traffic management. However, SECDEF could exempt the Department of Defense (DOD) from GSA authority in the interest of national security and in 1954 he moved the Department out from under the Administration's control.

1955 Hoover Commission: Criticized the general lack of modern traffic management in the federal government and recommended that SECDEF create a Director of Transportation under the Assistant Secretary of Defense (DEPSECDEF) for Supply and Logistics that would establish policy for traffic management. The Army agreed to centralization in principle but felt it should be the central traffic manager while the Navy and Air Force favored retaining traffic management functions in the services. In the end, the Joint Chiefs of Staff (JCS) failed to agree so they shelved the issue.

1956-1970: The Office of the Secretary of Defense (OSD) and the Army made several attempts to centralize traffic management but were thwarted by the services' inability to agree: the Navy and the Air Force believed traffic management was integral to the logistics system and thus must remain the responsibility of the individual services.

1956: The Secretary of Defense designated the Army Single Manager for continental US (CONUS) military traffic and created the Military Traffic Management Agency (MTMA).

1958: The House Committee on Government Operations registered a scathing indictment of DOD policies for procuring civil airlift and suggested centralization of military traffic management.

1961: The Military Traffic Management Agency placed under Defense Supply Agency and named Defense Traffic Management Service (DTMS).

1964: The Defense Traffic Management Service returned to the Army with a new name, Military Traffic Management and Terminal Service (MTMTS), recognizing its increased responsibilities.

Blue Ribbon Defense Panel (1970): Recommended creation of a Logistics Command to take over MTMTS and MSC traffic and terminal management functions. Military Airlift Command would be included in the new unified command.

DEPSECDEF Decision Memorandum (1971): Directed the merger of MTMTS and MSC into a Joint DOD Surface Transportation Command. DOD, however, failed to document any savings and assumed the Navy would not mind losing MSC. Congress killed the plan.

JCS ("Steadman") Study (1977): Examined several options for consolidating DOD surface transportation but concluded no deficiencies existed and recommended the status quo--MAC remain a specified command and MSC and Army's transportation operating agency, renamed Military Traffic Management Command (MTMC) in 1974, stay independent under their respective services. This study stands alone in not recommending consolidation.

JCS Exercise Nifty Nugget (Nov 1978): Demonstrated inefficiencies of the existing traffic management structure. Fragmented responsibilities for surface movement created severe coordination problems that inhibited responsiveness.

Report on the Feasibility of Consolidating the Military Traffic Management Command (MTMC) and the Military Sealift Command (MSC) (Apr 1979): The House Appropriations Committee (HAC) Surveys and Investigations staff recommended that a defense Traffic Management Agency (DTMA) assume MTMC and MSC traffic management responsibilities.

May 1979: The JCS established the Joint Deployment Agency (JDA) at MacDill AFB, Florida.

December 1979: The House/Senate Conference report on the FY 80 Defense Appropriation Bill directed DOD to develop an implementation plan for consolidation of MSC and MTMC and/or the creation of a DTMA in FY 80. In testimony before the HAC, DOD advised that further analysis of alternatives was required before a decision could be made. It set up a steering committee and contracted with Harbridge House.

Harbridge House Study (Sep 1980): Recommended establishment of a DTMA or a Unified Traffic Management Command (UTMC) comprised of MTMC and MSC as components. The Army would continue to operate ports and the Navy sealift.

November 1980: The JCS exercise Proud Spirit reinforced the findings of Nifty Nugget and OSD and congressional studies: no single agency was able to view the total transportation system and ensure efficient employment of all modes.

December 1980: The House/Senate Conference Committee on the FY 81 DOD Appropriations Act concluded that further study of this issue was not required and that DOD should submit a plan for a Unified Traffic Management Command or Agency by 1 May 1981.

January-April 1981: The reaction of the services and JCS to the Harbridge House recommendation was that, with its component command structure, the UTMC would increase layering and adequate weight was not given to wartime needs. The JCS decided to initiate their own review of the issue.

30 June 1981: After a review of the service responses and in order to be responsive to congressional direction, the Deputy Secretary of Defense approved a compromise proposal. He directed the transfer of sealift cargo and passenger booking and contract administration functions to MTMC by 1 October 1981, and asked the Joint Chiefs of Staff for a plan that would establish the organizational and procedural framework for performing joint wartime and contingency mobility planning and deployments, and peacetime and wartime traffic management.

24 July 1981: The JCS submitted concept and milestones for enhancement of deployment planning and execution. The JCS agreed unanimously that the management of the surface movement system could

best be accomplished by integration of the MTMC and MSC into a single command reporting through the JCS to the Secretary of Defense.

16 September 1981: The Deputy Secretary of Defense approved the JCS concept and associated milestones for implementation planning and established a senior-level steering group chaired by the JCS to oversee the work of the JCS Special Task Force. The Deputy Secretary set 1 October 1982 as the goal for completing the integration of MTMC and MSC. The Chairman of the Appropriations and Armed Services Committees, as well as other interested members, were advised of the course of action.

5 October 1981: The Military Export Cargo Offering and Booking Offices (MECOBOs) were established worldwide under MTMC supervision.

20 October 1981: The DOD announced the formation of the MECOBOs and approval of the concept for integration of MTMC and MSC.

16 November 1981: The Report of the House Appropriations Committee on the DOD Appropriations Bill, 1982, heartily endorsed the Deputy Secretary's decision of 16 September 1981, to merge MTMC and MSC.

January 1982: The JCS Special Task Force completed the implementation plan for integration of MTMC and MSC.

3 February 1982: The JCS by unanimous vote recommended the integration of MSC and MTMC into a unified Military Transportation Command (MTC). They provided an implementation plan and Terms of Reference for the MTC which would result in establishment of the MTC by 1 October 1982.

5 March 1982: The Secretary of the Navy recommended that the Secretary of Defense drop consideration of the MTC because it would do more harm than good in regard to sealift management.

10 March 1982: At hearings before the House Armed Services Committee, the Secretary of the Navy testified against the MTC proposal.

1 April 1982: The Secretary of the Navy in a memorandum to the Deputy Secretary of Defense elaborated on his opposition to the MTC and, again, suggested that he drop consideration of the proposal.

13 April 1982: The Senate Armed Services Committee reported the DOD Authorization Bill for FY 83 with a general provision prohibiting the consolidation of any of the functions of the transportation commands.

17 June 1982: The Deputy Secretary of Defense testified in support of the MTC at hearings before the Senate Armed Services Committee. His testimony was supported at these hearings by the Director of the Joint Staff and Commander, MTMC. The Commander, MSC, while supporting integration, testified that he believed that the commander should always be a Naval officer.

3 August 1982: The Deputy Secretary of Defense advised Senator John Tower of the results of a review of deployment capabilities by the Defense Science Board. Their findings confirmed the need for management improvements in the transportation area.

10 August 1982: Just prior to consideration of the MTC issue by the House/Senate conferees on the Authorization Bill, the Secretary of Defense sent letters to both Senator Tower and Congressman Melvin Price asking for their support and indicating that the Secretary of the Navy was prepared to carry out those steps necessary to implement the merger.

16 August 1982: The Conference Report on the DOD Authorization Bill was published. Its language prohibiting consolidation of the functions of the transportation commands was retained. Its language also suggested that DOD should seek legislation to enhance operations of the transportation commands.

August 1983: The Deputy Secretary of Defense approved a compromise plan for the MTC developed by the Army and Navy. This plan essentially would have converted MTMC into a unified MTC. Transportation contingency and execution planning would be consolidated in the MTC. MSC would have continued as a separate Navy command.

September 1983: The Deputy Secretary of Defense asked the JCS to prepare an implementation plan in 60 days. Letters were sent to the Chairmen of the House and Senate Armed Services Committees describing the compromise proposal for the MTC and requesting repeal of the prohibition against consolidating functions.

November 1984: The JCS recommended that DOD proceed with a systems development approach to resolving surface transportation planning and execution problems and hold in abeyance organizational changes.

January 1985: The Deputy Secretary of Defense approved JCS recommendations to proceed with systems development proposal. A joint flag/general officer steering group was established to oversee the effort

and report on the progress. The DOD proposals in the FY 84 and FY 85 authorization requests to repeal language prohibiting consolidation of transportation functions were rejected by Congress.

28 February 1986: President Reagan's Blue Ribbon Commission on Defense Management (Packard Commission) recommended, in its Interim Report, that Secretary of Defense Caspar W. Weinberger "establish a single unified command to integrate global air, land, and sea transportation."

28 March 1986: The Chairman, Joint Chiefs of Staff (CJCS), Admiral William J. Crowe, Jr., formed a general/flag officer steering committee and a full-time working group to plan for the establishment of a unified transportation command (UTC).

1 April 1986: President Reagan signed National Security Decision Directive No. 219 directing the Secretary of Defense to establish a unified transportation command.

29 September 1986: Goldwater-Nichols DOD Reorganization Act ordered the Secretary of Defense to consider creation of a unified transportation command with MAC, MTMC, and MSC and repealed the law prohibiting it.

31 December 1986: Deputy Secretary of Defense William H. Taft IV approved the JCS recommendation to unify MAC, MTMC, and MSC under a UTC with headquarters at Scott AFB, Illinois. In addition, the Joint Deployment Agency, MacDill AFB, Florida, would be disestablished and absorbed by the new command. Furthermore, Commander in Chief, MAC, (CINCMAC) would also serve as the UTC CINC. Finally, Deputy Secretary of Defense directed the CJCS to write an Implementation Plan and to establish the UTC in early 1987.

10 April 1987: The Secretary of Defense approved the USTRANSCOM Implementation Plan.

18 April 1987: President Reagan directed Secretary of Defense to establish the United States Transportation Command to provide global, air, land, and sea transportation to meet national security needs. The new command's mission was wartime oriented with few peacetime responsibilities other than deliberate planning and exercises.

1 July 1987: The Senate confirmed Air Force General Duane H. Cassidy as first Commander in Chief, United States Transportation Command (USCINCTRANS), thus activating the command at Scott AFB, Illinois.

1 October 1987: The formal activation ceremony of USTRANSCOM at Scott AFB, Illinois.

14 February 1992: Secretary of Defense Richard B. "Dick" Cheney signed a memorandum expanding the mission responsibilities of USTRANSCOM. "The mission of the Commander in Chief of the United States Transportation Command shall be to provide air, land, and sea transportation for the Department of Defense, both in time of peace and time of war."

1 June 1992: The Military Airlift Command inactivated and the Air Mobility Command (AMC) constituted and activated at Scott AFB, Illinois, in the biggest reorganization of the Air Force since it was formed in 1947.

8 January 1993: Donald J. Atwood, Acting Secretary of Defense, signed DOD Directive No. 5158.4 superseding SECDEF Cheney's memo of 14 February 1992. The new directive gave USCINCTRANS combatant command of the Transportation Component Commands (TCCs) in time of peace and time of war and made him DOD "single manager for transportation, other than service-unique or theater-assigned transportation assets."

SOURCE: Chronology (U), "Consolidation of Transportation in the Department of Defense," by Dr. James K. Matthews and Ms. Cora J. Holt, 1994.

APPENDIX 2

DESERT SHIELD/DESERT STORM: A CHRONOLOGY OF FORCE PROJECTION

James K. Matthews
Cora J. Holt

Research Center
United States Transportation Command
September 1995

DESERT SHIELD/DESERT STORM: A CHRONOLOGY OF FORCE PROJECTION*

24 Jul 90: **AIR FORCE.** Two KC-135 aircraft from the 306th Strategic Wing, Royal Air Force (RAF) Mildenhall, England, and one C-141 aircraft from Stuttgart, Germany, arrived at Al Dhafra, United Arab Emirates (UAE), to take part in exercise Ivory Justice.

2 Aug 90: Iraqi forces invaded Kuwait.

3-4 Aug 90: **AIR FORCE.** Intelligence gathering and strategic reconnaissance support aircraft arrived in the US Central Command (USCENTCOM) area of responsibility (AOR).

7 Aug 90: Operation Desert Shield began.

NAVY. The USS *Independence* Carrier Battle Group moved from the Indian Ocean into the Gulf of Oman.

NAVY. The USS *Dwight D. Eisenhower* Carrier Battle Group transited the Suez Canal into the Red Sea.

7-8 Aug 90: **AIR FORCE.** 24 F-15C/D aircraft from the 71st Tactical Fighter Squadron (TFS), 1st Tactical Fighter Wing (TWF), Langley AFB, Virginia, arrived at Dhahran AB, Saudi Arabia.

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*SOURCES: Rpt (U), USCENTCOM, After Action Report-Operation Desert Shield/Desert Storm, 15 Jul 91; Rpts (S), USCENTCOM, Situation Reports, 7 Aug 90-10 Mar 91, info used unclassified; Table (S), USCENTCOM, Combat Analysis Time Line-Arrival Dates of US and Allied Units, 7 Aug 90-21 Jan 91, n.d., info used unclassified. The USCENTCOM documents cited here offer few details. To provide additional information, for example unit designation and size, the chronology drew upon William T. Y'Blood's draft "The USAF and the Desert Shield First Phase Deployment, 7 August-8 November 1990" and the Association of the United States Army's "Special Report - Operations Desert Shield and Desert Storm: The Logistics Perspective," September 1991. The authors gleaned similar information from the Navy Office of Information "Navy Talking Papers," Summer 1990 and Winter 1991, and "Getting Marines to the Gulf," US Naval Institute *Proceedings* (1991), by US Marine Corps BrigGen Edwin H. Simmons, (Ret.), Director of Marine Corps History and Museums. For their comments, the authors also wish to thank Desert Storm veterans USCENTCOM Historian Dr. Hans Pawlisch, who as a lieutenant colonel in the US Army Reserve served with 1186th Transportation Terminal Unit (TTU) in Europe, Turkey, and Saudi Arabia; and US Marine Corps LtCol Robert Weimann, from USTRANSCOM's Strategic Plans Division, Plans and Resources Directorate, who served with Amphibious Ready Group Bravo ashore in Saudi Arabia and Kuwait.

AIR FORCE. Five E-3A Airborne Warning and Control System (AWACS) aircraft from the 552d Airborne Warning and Control Wing (AWACW), Tinker AFB, Oklahoma, arrived at Riyadh AB, Saudi Arabia.

8 Aug 90: **AIR FORCE.** Strategic Air Command (SAC) reported 81 tankers supporting Desert Shield.

9 Aug 90: **AIR FORCE.** 24 F-15C/D aircraft from the 27th TFS, 1st TFW, Langley AFB, Virginia, arrived at Dhahran AB, Saudi Arabia.

ARMY. 82d Airborne Ready Brigade, Fort Bragg, North Carolina, arrived in Saudi Arabia. Force numbered 2,300 soldiers.

10 Aug 90: **AIR FORCE.** 24 F-15E aircraft from the 336th TFS, 4th TFW, Seymour Johnson AFB, North Carolina, arrived at Thumrait, Oman.

AIR FORCE. 24 F-16C aircraft from the 17th TFS, 363d TFW, Shaw AFB, South Carolina, arrived at Al Dhafra, UAE.

COALITION. 12 RAF F-3 Tornado aircraft arrived at Dhahran AB, Saudi Arabia.

11 Aug 90: **AIR FORCE.** 24 F-16C aircraft from the 33d TFS, 363d TFW, Shaw AFB, South Carolina, arrived at Al Dhafra, UAE.

AIR FORCE. 16 C-130 aircraft from the 40th Tactical Airlift Squadron (TAS), 317th Tactical Airlift Wing (TAW), Pope AFB, North Carolina, arrived at Masirah, Oman.

12 Aug 90: **COALITION.** 12 RAF Jaguar aircraft arrived at Thumrait, Oman.

ARMY. 11th Air Defense Artillery Brigade, Fort Bliss, Texas, arrived in the AOR.

12-13 Aug 90: **AIR FORCE.** 14 B-52G aircraft from the 42d Bombardment Wing (BMW), Loring AFB, Maine, arrived at Diego Garcia.

13 Aug 90: **AIR FORCE.** 16 C-130 aircraft from the 41st TAS, 317th TAW, Pope AFB, North Carolina, arrived at Thumrait, Oman.

AIR FORCE. SAC reported 150 tankers supporting Desert Shield.

15 Aug 90: **AIR FORCE.** Six B-52G aircraft from the 42d BMW, Loring AFB, Maine, arrived at Diego Garcia bringing the total there to 20 as planned.

16 Aug 90: **AIR FORCE.** 16 C-130 aircraft from the 50th TAS, 314th TAW, Little Rock AFB, Arkansas, arrived at Bateen AB, UAE.

17 Aug 90: **AIR FORCE.** 24 F-4G aircraft from the 561st TFS, 35th TWF, George AFB, California, arrived at Shaikh Isa AB, Bahrain.

18 Aug 90: **AIR FORCE.** 24 A-10 aircraft from the 353d TFS, 354th TFW, Myrtle Beach AFB, South Carolina, arrived at King Fahd International Airport (IAP), Saudi Arabia.

20 Aug 90: **AIR FORCE.** 24 A-10 aircraft from the 355th TFS, 354th TFW, Myrtle Beach AFB, South Carolina, arrived at King Fahd IAP, Saudi Arabia.

MARINE CORPS. 18 AV-8B Harrier aircraft from the 3d Marine Aircraft Wing (MAW) arrived at Shaikh Isa AB, Bahrain.

21 Aug 90: **AIR FORCE.** 18 F-117A aircraft from the 415 TFS, 37th TFW, Tonapah Test Range, Nevada, arrived in the AOR.

MARINE CORPS. 14 AV-8B Harrier aircraft arrived at Shaikh Isa AB, Bahrain.

22 Aug 90: **MARINE CORPS.** 24 F/A-18 Hornet aircraft from the 3d MAW arrived at Shaikh Isa AB, Bahrain.

MARINE CORPS. 23 F/A-18 aircraft arrived at Shaikh Isa AB, Bahrain.

NAVY. The USS *Wisconsin* transited the Strait of Hormuz into the Persian Gulf.

25 Aug 90: **AIR FORCE.** 18 F-111F aircraft from the 492d TFS, 48 TFW, RAF Lakenheath, England, arrived at Taif AB, Saudi Arabia.

MARINE CORPS. 7th Marine Expeditionary Brigade (MEB), Twentynine Palms, California, combat ready in the AOR. The 7th MEB Commander, Major General John I. Hopkins, as Commanding General I Marine Expeditionary Force (Forward), assumed responsibility for the defense of the approaches to the vital seaport of Al Jubayl. His brigade numbered 15,248 Marines, 123 tanks, 425 heavy weapons, and 124 fixed and rotary wing aircraft. Supported by Maritime Prepositioning Squadron 2 (Indian Ocean).

MARINE CORPS. 20 A-6E/EA-6B aircraft from the 3d MAW arrived at Shaikh Isa AB, Bahrain.

26 Aug 90: **ARMY.** 82d Airborne Division, Fort Bragg, North Carolina, closed in AOR. Included 12,000 soldiers and 3,200 wheeled vehicles.

JOINT. Army General H. Norman Schwarzkopf, Commander in Chief, United States Central Command, established his headquarters in Saudi Arabia.

AIR FORCE. 16 C-130 aircraft from the 37th TAS, 435th TAW, Rhein-Main AB, Germany, closed at Bateen AB, UAE. (Several of the unit's aircraft had arrived in the AOR on the 21st.)

AIR FORCE. 10 KC-135 aircraft arrived at Seeb, Oman.

28 Aug 90: **AIR FORCE.** 16 C-130 aircraft arrived at Al Ain, UAE.

29 Aug 90: **AIR FORCE.** 24 F-16C aircraft from the 416th TFS, 401st TWF, Torrejon AB, Spain, arrived at Doha AB, Qatar.

30 Aug 90: **AIR FORCE.** 24 F-16C aircraft from the 4th TFS, 388th TFW, Hill AFB, Utah, arrived at Al Minhad AB, UAE.

31 Aug 90: **AIR FORCE.** 24 F-15C aircraft from the 58th TFS, 33d TFW, Eglin AFB, Florida, completed their deployment to Tabuk AB, Saudi Arabia. As of this date, US F-15 strength in the AOR was 72 aircraft.

AIR FORCE. 24 A-10 aircraft from the 74th TFS, 23d TFW, England AFB, Louisiana, arrived at King Fahd IAP, Saudi Arabia.

1 Sep 90: **AIR FORCE.** 24 F-16C aircraft from the 421st TFS, 388th TFW, Hill AFB, Utah, arrived at Al Minhad, UAE. As of this date, US F-16C strength in the AOR was 120 aircraft.

AIR FORCE. Six EC-130 Airborne Battlefield Command and Control (ABCC) aircraft from the 7th Airborne Command and Control Squadron, Keesler AFB, Mississippi, arrived at Sharjah AB, UAE.

2 Sep 90: **AIR FORCE.** 24 A-10 aircraft from the 76th TFS, 23d TFW, England AFB, Louisiana, arrived at King Fahd IAP, Saudi Arabia. As of this date, US A-10 strength in the AOR was 96 aircraft.

AIR FORCE. 14 F-111F aircraft from the 493d and 494th TFSs, 48th TFW, RAF Lakenheath, England, arrived at Taif AB, Saudi Arabia. As of this date, US F-111F strength in the AOR was 32 aircraft.

NAVY. USS *Dwight D. Eisenhower* Carrier Battle Group transited Strait of Gibraltar en route to home port.

5 Sep 90: **AIR FORCE.** 12 F-4G Wild Weasel aircraft from the 81st and 480th TFSs, 52d TFW, Spangdahlem AB, Germany, arrived at Shaikh Isa AB, Bahrain. As of this date, total US F-4G strength in the AOR stood at 36 aircraft.

6 Sep 90: **MARINE CORPS.** I Marine Expeditionary Force (MEF) (1st Marine Division, 3d Marine Aircraft Wing, and 1st Force Service Support Group) combat ready. I MEF assumed command of all marine forces ashore, combining the ground, air, and service support elements of 7th MEB and 1st MEB (along with follow-on forces).

7 Sep 90: **AIR FORCE.** 10 KC-135R aircraft arrived at Jeddah AB, Saudi Arabia.

MARINE CORPS. 13th Marine Expeditionary Unit (MEU), Special Operations Capable (SOC) Amphibious, forward deployed to Western Pacific, combat ready in the Gulf of Oman. The 13th MEU included Battalion Landing Team 1st Battalion/4 Regiment, reinforced Medium Helicopter Squadron 164, and Marine Service Support Group 13, Camp Pendleton, California.

JOINT. Department of Defense announced that US forces in the Persian Gulf had topped 100,000.

8 Sep 90: **AIR FORCE.** 16 ANG C-130 aircraft from five different units arrived in Al Ain AB, UAE, as the 130th Provisional Tactical Airlift Squadron.

10 Sep 90: **MARINE CORPS.** 1st MEB, Kaneohe, Hawaii, combat ready in the AOR. The core of the 1st MEB was the 3d Marine Regiment with two infantry battalions. Supported by Maritime Prepositioning Squadron 3 (Pacific).

12 Sep 90: **AIR FORCE.** 16 C-130 aircraft from four different reserve units completed their deployment to Sharjah, UAE, as the 94th and later the 440th Provisional TAS. As of this date, C-130 strength in the AOR stood at 96 aircraft.

JOINT. Phase I combat aircraft deployment completed. Strength in the AOR included 962 fixed wing aircraft (600 combat).

14 Sep 90: **NAVY.** USS *John F. Kennedy* Carrier Battle Group transited the Suez Canal into the Red Sea.

16 Sep 90: **MARINE CORPS.** 4th MEB combat ready in the Gulf of Oman. Drawn from North Carolina and South Carolina bases, the brigade numbered about 8,000 Marines.

17 Sep 90: **MARINE CORPS.** Amphibious Ready Group Bravo, Okinawa, combat ready in the AOR and attached to the 3d Marine Regiment on shore as its third battalion.

21 Sep 90: **NAVY.** USS *Saratoga* Carrier Battle Group transited the Suez Canal into the Red Sea.

23 Sep 90: **ARMY.** 24th Infantry Division (Mechanized), Fort Stewart, Georgia, closed in the AOR. It included 18,000 soldiers, 1,575 tracked vehicles, 3,500 wheeled vehicles, and 90 helicopters. (By the time the war started on 24 February, the division numbered 25,000 soldiers, 6,600 wheeled vehicles, and 1,790 tracked vehicles.)

COALITION. Six RAF F-3 Tornado aircraft arrived at Dhahran AB, Saudi Arabia, bringing the total there to 18 aircraft.

24 Sep 90: **ARMY.** The 197th Infantry Brigade (Mechanized), Fort Benning, Georgia, closed in the AOR.

26 Sep 90: **COALITION.** Eight Italian Air Force F-3 Tornado aircraft arrived at Al Dhafra AB, UAE.

28 Sep 90: **AIR FORCE.** First tankers arrived at Cairo West (two KC-135Rs with a third arriving on 3 October).

1 Oct 90: **ARMY.** 12th Combat Aviation Brigade, Germany, closed in the AOR.

ARMY. 1st Corps Support Command (1st COSCOM), Fort Bragg, North Carolina, closed in the AOR.

ARMY. XVIII Airborne Corps Artillery, Fort Bragg, North Carolina, closed in the AOR.

NAVY. USS *Independence* Carrier Battle Group transited the Strait of Hormuz. This was the first time a carrier had entered the Persian Gulf to conduct operations. (The USS *Constellation* had entered the Gulf in 1974 for a port visit.) On 4 October the force left the Gulf to take up station in the North Arabian Sea.

NAVY. Three minesweepers and the mine countermeasures ship USS *Avenger*, loaded onboard the *Super Servant III*, arrived in Bahrain.

3 Oct 90: **COALITION.** First increment of French 6th Light Armored Division closed in the AOR.

6 Oct 90: **ARMY.** 101st Airborne Division (Air Assault), Fort Campbell, Kentucky, closed in the AOR.

COALITION. Egyptian 3d Mechanized Division closed in the AOR.

7 Oct 90: **COALITION.** Eight French Air Force Mirage 2000 and eight Mirage F-1 aircraft arrived at Al Hasa AB, Saudi Arabia.

10 Oct 90: **COALITION.** Eight Canadian CF-18 aircraft arrived at Doha, Qatar.

COALITION. French Mechanized Brigade closed in the AOR.

14 Oct 90: **ARMY.** 3d Armored Cavalry Regiment, Fort Bliss, Texas, closed in the AOR.

NAVY. US Naval forces in the AOR numbered 53 warships and 46,000 personnel.

17 Oct 90: **ARMY.** 2d Armored Division (1st "Tiger" Brigade), Fort Hood, Texas, closed in the AOR.

22 Oct 90: **ARMY.** 1st Cavalry Division, Fort Hood, Texas, closed in the AOR.

ARMY. III Corps Artillery (elements), Fort Sill, Oklahoma, closed in the AOR.

30 Oct 90: **ARMY.** There were 117,245 Army personnel in the AOR.

1 Nov 90: **MARINE CORPS.** Nearly 42,000 Marines, close to one-quarter of the Corps' active duty strength and a fifth of the total US forces in Desert Shield, had been deployed to the AOR. More than 31,000 were ashore in the I MEF. Those remaining, the 4th MEB and the 13th MEU (SOC), were afloat as an amphibious task force.

NAVY. The carrier USS *Midway* and seven escort ships joined the USS *Independence* in the Northern Arabian Sea. The USS *Saratoga* and the USS *John F. Kennedy* remained in the Red Sea.

ARMY. 8th Psychological Battalion (-), Fort Bragg, North Carolina, closed in the AOR.

JOINT. USCINCCENT confirmed he had 210,000 American troops in his AOR.

COALITION. 24 French helicopters and support troops deployed to Yanbu, Saudi Arabia.

8 Nov 90: Chairman, Joint Chiefs of Staff, directed deployment of additional US Forces into the AOR following the President's announcement that he intended to set a foundation for offensive action if Iraq did not withdraw from Kuwait.

20 Nov 90: **COALITION.** Deployment of United Kingdom's 7th Armored Brigade completed. The famed "Desert Rats" included about 9,000 troops and 120 Challenger tanks.

29 Nov 90: **AIR FORCE.** 20 F-111F aircraft arrived at Taif AB, Saudi Arabia, marking the start of Phase II deployment.

30 Nov 90: **ARMY.** 13th COSCOM, Fort Hood, Texas, closed in the AOR. As of this date, there were 135,286 Army personnel in the AOR.

4 Dec 90: **AIR FORCE.** 18 F-117 aircraft arrived in the AOR.

18 Dec 90: **COALITION.** Syrian 9th Armored Division closed in AOR. The unit included approximately 20,000 soldiers and 150 Soviet-made T-62 tanks.

20 Dec 90: **AIR FORCE.** 24 F-15C aircraft from the 53d TFS arrived at Al Kharj AB, Saudi Arabia, bringing the total number of US F-15s intheater to 96.

NAVY. USS *Independence* Carrier Battle Group departed AOR for home port of San Diego, California.

21 Dec 90: **ARMY.** 2d Armored Cavalry Regiment, Nuremberg, Germany, closed in the AOR. As of this date, there were 178,607 Army personnel in the AOR.

26 Dec 90: **AIR FORCE.** 11 F-4G aircraft from the 81st TFS arrived at Shaikh Isa AB, Bahrain, bringing the total of US F-4s intheater to 48.

29 Dec 90: **AIR FORCE.** 18 A-10 aircraft arrived at King Fahd IAP, Saudi Arabia.

30 Dec 90: **AIR FORCE.** 22 ANG F-16A aircraft from the 157th TFS arrived at Al Kharj AB, Saudi Arabia.

ARMY. There were 197,743 Army personnel in the AOR.

1 Jan 91: **AIR FORCE.** 24 F-16C aircraft from the 10th TFS, Hahn AB, Germany, arrived at Al Dhafra, UAE.

NAVY. USS *Missouri* arrived in the Gulf of Oman.

NAVY. US ship strength in the area of operations was 55: 25 in the Persian Gulf, 20 in the North Arabian Sea/Gulf of Oman, and 10 in the Red Sea.

6 Jan 91: **AIR FORCE.** 18 A-10 and six OA-10 aircraft arrived at King Fahd IAP, Saudi Arabia. As of this date, there were 132 A-10 and 12 OA-10 aircraft in the AOR.

7 Jan 91: **COALITION.** Egyptian 4th Armored Division deployment completed.

8 Jan 91: **ARMY.** 11th Aviation Brigade closed in the AOR.

MARINE CORPS. 2d Marine Division, Camp Lejeune, North Carolina, combat ready in AOR. Supported by Maritime Prepositioning Squadron 1 (Atlantic).

AIR FORCE. 24 F-16C aircraft from the 69 TFS arrived at Al Minhad, UAE. There were at this time 168 F-16C and 42 F-16A aircraft deployed intheater.

9 Jan 91: **COALITION.** United Kingdom's 4th Mechanized Brigade, First Armored Division (-) HQ, closed in the AOR.

11 Jan 91: **ARMY.** 2d COSCOM, Stuttgart, Germany, closed in the AOR.

12 Jan 91: **COALITION.** Second increment of French 6th Light Armored Division closed in the AOR.

NAVY. USS *Ranger* Carrier Battle Group arrived on station in the North Arabian Sea.

13 Jan 91: **ARMY.** Headquarters, VII Corps, Stuttgart, Germany, closed in the AOR. VII Corps included 1,400 tanks and 1,200 fighting vehicles, the largest armored corps in history.

14 Jan 91: **AIR FORCE.** 12 RF-4C aircraft arrived at Shaikh Isa AB, Bahrain, for a total of 18 intheater.

NAVY. USS *Theodore Roosevelt* Carrier Battle Group transited the Suez Canal into the Red Sea.

MARINE CORPS. 5th MEB combat ready in the AOR. From San Diego, California, it numbered about 7,500 Marines on 13 ships of Amphibious Group Three. It was reinforced with the 5th Marine Regiment, an aviation element, and a combat service support element. Embedded in the 5th MEB was the 11th MEU (SOC).

15 Jan 91: **AIR FORCE.** 21 KC-10 and 21 KC-135 aircraft arrived intheater.

MARINE CORPS. 2d Force Service Support Group (FSSG), based mainly at Camp Lejeune, North Carolina, and the 2d MAW, based largely at Marine Corps Station, Cherry Point, North Carolina, combat ready in the AOR. 2d FSSG attached to the 2d Marine Division. 2d MAW aircraft attached to the 3d MAW. (II MEF colors did not deploy as originally planned.)

NAVY. The USS *America* Carrier Battle Group transited the Suez Canal into the Red Sea.

17 Jan 91: D-Day. Operation Desert Storm commenced at 3 a.m. (16 January 1991, 7 p.m. Eastern time).

COALITION AIR. Total aircraft strength intheater for D-Day was 1,963: 1,299 combat and combat support, 258 tankers, 144 airlift, 45 command and control, 114 reconnaissance/surveillance, and 103 other support aircraft.

NAVY. Six carrier battle groups intheater: USS *America*, USS *Saratoga*, and USS *Kennedy* in the Red Sea; USS *Midway* and USS *Ranger* in the Gulf; and the USS *Roosevelt* en route from the Red Sea to the Gulf. Ship strength in AOR was 108: 34 in the Persian Gulf, 35 in the North Arabian Sea/Gulf of Oman, 26 in the Red Sea, and 13 in the Mediterranean.

MARINE CORPS. Marine Corps troops numbered nearly 84,000 (66,000 ashore and 18,000 afloat), almost half the Corps' active duty strength.

ARMY. There were nearly 250,000 Army personnel in the AOR.

18 Jan 91: **ARMY.** 2d Brigade, 2d Armored Division (Forward), Germany, closed intheater.

21 Jan 91: **ARMY.** 1st Armored Division, Ansbach, Germany, closed in the AOR.

NAVY. USS *Theodore Roosevelt* Carrier Battle Group arrived on station in the Persian Gulf.

26 Jan 91: **ARMY.** 1st Infantry Division (Mechanized), Fort Riley, Kansas, closed in AOR.

7 Feb 91: **ARMY.** 3d Armored Division, Frankfurt, Germany, closed in the AOR.

14 Feb 91: **NAVY.** USS *America* entered the Gulf bringing the number of carrier battle groups there to four (USS *America*, USS *Roosevelt*, USS *Midway*, and USS *Ranger*). USS *Saratoga* and USS *Kennedy* remained in the Red Sea.

23 Feb 91: **ARMY.** There were 300,199 Army personnel in the AOR.

24 Feb 91: Ground war commenced at 4 a.m. (23 February 1991, 8 p.m. Eastern time.)

28 Feb 91: Cessation of hostilities, 8:01 a.m. (12:01 a.m. Eastern time.)

APPENDIX 3

DESERT SHIELD/DESERT STORM AIRLIFT SUMMARY BY CIVIL AIR CARRIER

(As of 31 March 1991)

CARRIER		AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
AAL	Missions	5	14	15	0	2	12	0	16	64
American	Short Tons	189	568	432	0	65	744	0	518	2,516
Airlines	Passengers	1,342	5,310	3,491	0	369	4,101	0	2,901	17,514
AMT	Missions	10	14	32	13	124	31	26	57	307
American	Short Tons	362	476	1,020	420	5,524	1,338	1,048	1,630	11,818
Trans Air Inc	Passengers	2,045	2,500	6,713	1,976	26,057	7,248	4,710	10,491	61,740
ARW	Missions	0	0	0	0	2	14	38	23	77
Arrow Air	Short Tons	0	0	0	0	59	867	847	388	2,161
	Passengers	0	0	0	0	0	8	0	5	13
ATN	Missions	13	10	8	21	8	14	21	20	115
Air Transport	Short Tons	343	233	197	474	186	617	494	335	2,879
International	Passengers	65	0	0	0	0	0	0	0	65
AWE	Missions	0	0	0	0	5	4	2	6	17
American	Short Tons	0	0	0	0	248	353	75	304	980
West	Passengers	0	0	0	0	1,484	1,954	112	2,112	5,662
BVA	Missions	0	0	1	0	5	0	8	1	15
Buffalo	Short Tons	0	0	34	0	81	52	142	20	329
Airlines	Passengers	0	0	0	0	0	0	0	0	0
CKS	Missions	22	29	12	28	37	19	90	117	354
Connie	Short Tons	705	749	330	647	867	842	2,177	2,389	8,706
Kalitta Services	Passengers	0	73	0	33	363	0	0	2	471

APPENDIX 3 (Con't)

CARRIER		AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
COA (CRA)	Missions	1	4	3	0	8	5	7	13	41
Continental	Short Tons	50	173	130	0	331	414	467	701	2,266
Airlines	Passengers	0	1,402	967	0	2,002	1,498	1,689	4,465	12,023
DAL	Missions	1	0	0	0	3	3	0	9	16
Delta	Short Tons	19	0	0	0	138	175	0	268	600
Airlines	Passengers	157	0	0	0	545	681	0	1,613	2,996
EAL	Missions	6	1	0	0	6	9	0	0	22
Eastern	Short Tons	184	40	0	0	194	307	0	0	725
Airlines	Passengers	1,257	230	0	0	1,229	1,886	0	0	4,602
EIA	Missions	11	17	23	20	38	27	39	44	219
Evergreen	Short Tons	556	909	1,223	995	1,680	3,752	1,711	1,359	12,185
Int'l Airlines	Passengers	785	2	2	242	0	18	0	422	1,471
FDX	Missions	12	27	34	28	53	43	80	105	382
Federal	Short Tons	864	2,396	2,703	2,387	4,623	6,179	6,625	8,048	33,825
Express	Passengers	1,994	6	616	0	1,014	709	215	11	4,565
FLW (FTL)	Missions	1	0	0	0	11	0	16	0	28
(FWL) Florida	Short Tons	69	0	0	0	230	322	330	0	951
West Air	Passengers	350	0	0	0	0	0	2	0	352
HAL	Missions	2	15	29	20	17	17	27	33	160
Hawaiian	Short Tons	41	398	493	219	253	871	505	816	3,596
Airlines Inc	Passengers	338	2,577	2,909	1,100	798	4,972	1,822	5,267	19,783
ILL	Missions	0	6	9	6	6	2	11	5	45
International	Short Tons	0	456	596	450	457	363	497	110	2,929
Loaned Lift	Passengers	0	0	0	0	0	0	0	0	0

APPENDIX 3 (Con't)

CARRIER		AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
KEY	Missions	0	0	1	5	0	0	0	0	6
Key Airlines	Short Tons	0	0	6	63	0	0	0	0	69
	Passengers	0	0	51	233	0	0	0	0	284
NWA	Missions	21	46	26	28	46	23	52	48	290
Northwest	Short Tons	1,278	2,871	1,086	1,926	3,178	2,742	3,175	2,822	19,078
Airlines Inc	Passengers	6,061	10,591	7,732	3,507	8,624	6,267	6,422	13,951	63,155
PAA	Missions	7	11	19	10	26	14	53	50	190
Pan Am	Short Tons	451	511	741	513	1,658	2,032	3,514	2,999	12,419
World Airways	Passengers	2,806	3,838	6,337	2,694	8,989	8,117	3,010	16,109	51,900
RAF	Missions	0	0	0	0	0	0	5	2	7
Royal Air	Short Tons	0	0	0	0	0	5	195	53	253
Force	Passengers	0	0	0	0	0	0	340	20	360
RAX	Missions	15	24	0	12	26	47	85	91	300
Rosenbalm	Short Tons	444	608	0	297	663	2,447	2,571	1,723	8,753
Aviation	Passengers	8	150	0	0	0	0	0	433	591
RVV	Missions	0	0	0	0	7	32	56	31	126
Reeve	Short Tons	0	0	0	0	30	340	388	226	984
Aleutian	Passengers	0	0	0	0	278	2,377	2,751	1,690	7,096
SCX	Missions	0	1	3	2	6	1	2	2	17
Sun Country	Short Tons	0	41	44	56	227	45	92	103	608
Air Transport	Passengers	0	236	695	116	1,400	0	473	613	3,533
SJM	Missions	14	16	11	21	32	11	59	22	186
Southern	Short Tons	406	454	317	436	613	777	1,129	409	4,541
Air Transport	Passengers	0	0	0	0	0	0	0	0	0

APPENDIX 3 (Con't)

CARRIER		AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
TCN	Missions	2	2	0	0	0	1	1	0	6
Transconti-	Short Tons	12	41	0	0	0	22	20	0	95
nental Airlines	Passengers	162	290	0	0	0	0	0	0	452
TOW	Missions	6	11	15	6	26	14	11	17	106
Tower Air	Short Tons	327	728	713	307	1,740	1,273	549	1,126	6,763
	Passengers	2,622	4,135	5,129	2,114	9,580	7,776	3,297	7,253	41,906
TWA	Missions	6	8	7	3	24	20	15	33	116
Trans World	Short Tons	387	392	243	164	1,535	2,096	715	2,028	7,560
Airlines	Passengers	2,064	3,091	2,232	810	8,820	11,580	3,973	13,476	46,046
UAL	Missions	11	7	6	0	20	19	2	35	100
United	Short Tons	651	396	232	0	1,167	1,261	143	1,928	5,778
Airlines	Passengers	4,270	2,422	2,091	0	6,542	6,749	0	13,076	35,150
UPS	Missions	5	18	0	11	0	0	58	0	92
United	Short Tons	377	1,329	0	893	0	1,481	4,428	0	8,508
Parcel Services	Passengers	0	1	0	350	0	0	7	0	358
WOA	Missions	25	22	5	2	38	25	42	34	193
World	Short Tons	1,144	1,181	187	90	1,639	1,760	1,675	1,326	9,002
Airways	Passengers	6,219	2,306	814	0	7,032	3,933	529	3,615	24,448
999	Missions	2	1	0	0	1	1	1	1	7
(Other)	Short Tons	90	30	0	0	40	24	71	15	270
	Passengers	14	150	0	0	0	0	347	403	914
TOTAL Missions		198	304	259	236	577	408	807	815	3,604
TOTAL Short Tons		8,949	14,980	10,727	10,337	27,426	33,501	33,583	31,644	171,147
TOTAL Passengers		32,559	39,310	39,779	13,175	85,126	69,874	29,699	97,928	407,450

SOURCE: Military Air Integrated Reporting System (MAIRS) Database, Military Airlift Command, Operations and Transportation, Command Center Reports (MAC/XOCR).

APPENDIX 4

DESERT SHIELD/DESERT STORM AMMUNITION DELIVERY BY PORT (US AND FOREIGN)

(7 August 1990 - 10 March 1991)

US PORTS

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
CONCORD, CA	*Cape Breton*	BB	RRF	14 Sep 90	14 Oct 90	Ad Damman	9,280	Ammo
	Anna L	BB	FOR	10 Oct 90	14 Nov 90	Bahrain	4,406	MEF/Ammo
	Austral Lightning	LASH	RRF	20 Dec 90	15 Jan 91	Ad Damman	6,388	USAF Ammo
	Hanjin Jeddah	BB	FOR (NC)	1 Jan 91	5 Feb 91	Al Jubayl	8,079	USMC Ammo
	Neptune Peridot	BB	FOR	25 Jan 91	(U-TURN)		5,095	USMC Ammo
	Merchant Premier	BB	FOR	8 Feb 91	(U-TURN)		9,663	USMC Ammo
	Letitia Lykes	BB	US	20 Feb 91	(U-TURN)		8,701	USAF Ammo
	Sletter	BB	FOR	24 Feb 91	(U-TURN)		8,566	USMC Ammo
	Flag Mars	BB	FOR	26 Feb 91	(U-TURN)		8,183	USAF Ammo
EARLE, NJ	*Crystal Star*	BB	FOR	28 Jan 91	21 Feb 91	Ad Damman	5,007	USN/USMC Ammo
	Pride	BB	RRF	10 Feb 91	(U-TURN)		6,694	USMC Ammo
GUAM	*Cape Gibson*	BB	RRF	30 Jan 91	14 Feb 91	Jeddah	7,985	USAF Ammo
	Cape Borda	BB	RRF	19 Feb 91	1 Mar 91	Diego Garcia	7,481	USAF Ammo
	Cape Juby	BB	RRF	23 Feb 91	(U-TURN)		4,774	USMC Ammo
LUALUALEI, HI	*Cape Juby*	BB	RRF	11 Feb 91	(U-TURN)		4,852	USMC/USN Ammo
SUNNY POINT	*Cleveland*	BB	US	31 Aug 90	21 Sep 90	Ad Damman	11,533	Ammo
MILITARY OCEAN	*Cape Archway*	BB	RRF	11 Sep 90	9 Oct 90	Ad Damman	9,584	Ammo
TERMINAL, NC	*Rover*	RO/RO	US	19 Sep 90	11 Oct 90	Ad Damman	6,187	Ammo
	Green Harbour	LASH	US (PREPOS)	8 Oct 90	3 Nov 90	Ad Damman	14,777	Ammo
	Tampa Bay	BB	US	9 Nov 90	30 Nov 90	Ad Damman	7,226	Ammo
	Green Island	LASH	US (PREPOS)	8 Dec 90	6 Jan 91	Ad Damman	24,689	Ammo
	Cape Florida	LASH	RRF	8 Dec 90	14 Jan 91	Ad Damman	25,815	Ammo
	Cape Flattery	LASH	RRF	18 Dec 90	16 Jan 91	Ad Damman	25,386	Ammo
	Winter Sea	REEFER	FOR	28 Dec 90	18 Jan 91	Ad Damman	8,912	Ammo
	American Kestral	LASH	US (PREPOS)	1 Jan 91	4 Feb 91	Ad Damman	18,536	Ammo
	Winter Water	REEFER	FOR	6 Jan 91	26 Jan 91	Ad Damman	8,912	Ammo

APPENDIX 4 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
SUNNY POINT	*Belle*	BB	FOR	15 Jan 91	(U-TURN)		8,678	Ammo
MILITARY OCEAN	*Anangel Leader*	BB	FOR	23 Jan 91	(U-TURN)		19,490	Ammo
TERMINAL, NC	*Dock Express II*	BB	FOR	23 Jan 91	21 Feb 91	Ad Damman	3,835	Ammo
(Con't)	*Almas*	BB	FOR	24 Jan 91	(U-TURN)		7,592	Ammo
	Courier	BB	RRF	25 Jan 91	(U-TURN)		9,187	USMC Ammo
	Zoella Lykes	BB	US	26 Jan 91	(U-TURN)		9,493	USMC Ammo
	Mar Courrier	BB	FOR	31 Jan 91	(U-TURN)		8,972	Ammo
	Aetos	BB	FOR	1 Feb 91	(U-TURN)		8,175	Ammo
	Amitie	BB	FOR	1 Feb 91	(U-TURN)		10,132	Ammo
	Cape Nome	BB	RRF	5 Feb 91	(U-TURN)		5,657	Ammo
	Kubbar	BB	FOR (NC)	8 Feb 91	(U-TURN)		12,568	Ammo
	Lake	BB	RRF	8 Feb 91	(U-TURN)		8,150	Ammo
	Noble Star	BB	US (PREPOS)	9 Feb 91	(U-TURN)		7,005	Containerized Ammo
	Gulf Banker	BB	RRF	10 Feb 91	(U-TURN)		7,388	Ammo
	Nancy Lykes	BB	US	12 Feb 91	(U-TURN)		6,986	Ammo
	Ruth Lykes	BB	US	17 Feb 91	(U-TURN)		8,814	Ammo
	Buyer	BB	RRF	18 Feb 91	(U-TURN)		8,647	Ammo
	Mosstar	BB	FOR	18 Feb 91	(U-TURN)		8,531	Ammo
	Cape Johnson	BB	RRF	22 Feb 91	(U-TURN)		9,374	Ammo
	Cape Blanco	BB	RRF	28 Feb 91	(U-TURN)		9,112	Ammo
	Anna L	BB	FOR	9 Mar 91	(U-TURN)		Unknown	Ammo
	Santa Ana	BB	RRF	9 Mar 91	(U-TURN)		8,026	Ammo

APPENDIX 4 (Con't)

FOREIGN PORTS

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
AMSTERDAM, NETHERLANDS	*Joseph Lykes*	BB	US	24 Jan 91	(U-TURN)		3,045	USA Ammo
	Galveston Bay	BB	US	2 Feb 91	(U-TURN)		4,744	USA Ammo
	Perla One	BB	FOR	13 Feb 91	(U-TURN)		9,283	USA Ammo
	Cape Carthage	BB	RRF	22 Feb 91	(U-TURN)		7,420	Sustainment Ammo
	Efdim Junior	BB	FOR	27 Feb 91	(U-TURN)		5,849	Sustainment Ammo
CARTAGENA, SPAIN	*Joseph Lykes*	BB	US	21 Feb 91	(U-TURN)		5,455	USAF Ammo
CHINAE, KOREA	*Rover*	RO/RO	US	19 Dec 90	20 Jan 91	Jeddah	2,732	USAF Ammo
	Hanjin Damman	BB	FOR (NC)	13 Feb 91	(U-TURN)		9,022	Ammo
EEMSHAVEN, NETHERLANDS	*Toxa*	BB	FOR	23 Dec 90	16 Jan 91	Ad Damman	4,370	USAFE Ammo
	American Prabha	BB	FOR	17 Jan 91	(U-TURN)		5,915	Sustainment Ammo
	Cape Breton	BB	RRF	29 Jan 91	(U-TURN)		6,783	USA Sustainment Ammo
	Paci	BB	FOR	4 Feb 91	(U-TURN)		5,481	USA Sustainment Ammo
	Vhahos	BB	FOR	23 Feb 91	(U-TURN)		7,441	USA Sustainment Ammo
EMDEN, NETHERLANDS	*American Shakti*	BB	FOR	11 Feb 91	(U-TURN)		7,873	USA Sustainment Ammo
	Encouragement	BB	FOR	26 Feb 91	(U-TURN)		7,189	Sustainment Ammo
GLEN DOUGLAS, SCOTLAND	*Cape Catoche*	BB	RRF	1 Feb 91	19 Feb 91	Al Jubayl	6,204	USMC Ammo
LISBON, PORTUGAL	*Danah*	BB	FOR (NC)	25 Jan 91	15 Feb 91	Bahrain	7,914	Ammo
	Galveston Bay	BB	US	14 Feb 91	(U-TURN)		6,312	Ammo
NEWPORT, WALES	*Westman*	BB	FOR	27 Jan 91	9 Feb 91	Jeddah	10,647	Ammo
	Agios Spyridon	BB	FOR	5 Feb 91	(U-TURN)		8,126	Ammo
	Avanti	BB	FOR	20 Feb 91	(U-TURN)		4,432	Ammo

APPENDIX 4 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
NORDENHAM, GERMANY	*Green Wave*	BB	US	3 Oct 90	22 Oct 90	Ad Damman	4,414	Ammo
	Cape Catoche	BB	RRF	14 Nov 90	1 Dec 90	Ad Damman	5,274	Ammo
	Cape Farewell	LASH	RRF	25 Nov 90	31 Dec 90	Ad Damman	14,607	POMCUS/Ammo/78 M1A1
	Cape Juby	BB	RRF	1 Dec 90	17 Dec 90	Ad Damman	6,097	Ammo
	Cape Gibson	BB	RRF	14 Dec 90	29 Dec 90	Ad Damman	15,410	Ammo
	Unisierra	BB	FOR	22 Dec 90	10 Jan 91	Ad Damman	3,375	Ammo/1st AD
	American Shanti	BB	FOR	7 Jan 91	28 Jan 91	Al Jubayl	5,306	Ammo
	Mostwenn 4	BB	FOR	14 Jan 91	7 Feb 91	Ad Damman	6,805	USA Sustainment Ammo
	Neos	BB	FOR	21 Jan 91	17 Feb 91	Ad Damman	5,558	USA Sustainment Ammo
	Cape Clear	BB	RRF	25 Jan 91	13 Feb 91	Al Jubayl	5,116	USA Sustainment Ammo
	Agas	BB	FOR	2 Feb 91	(U-TURN)		6,808	USA Sustainment Ammo
	Advantage	BB	US (PREPOS)	5 Feb 91	(U-TURN)		11,743	USA Sustainment Ammo
	Samsun Honor	BB	FOR (NC)	13 Feb 91	25 Feb 91	Turkey	2,277	Proven Force Ammo
	Gallant II	BB	FOR	15 Feb 91	(U-TURN)		9,333	USA Sustainment Ammo
	Enarxis	BB	FOR	19 Feb 91	(U-TURN)		6,160	USA Sustainment Ammo
	Mariner	BB	FOR	25 Feb 91	(U-TURN)		6,076	Sustainment Ammo
	Cape Bon	BB	RRF	27 Feb 91	(U-TURN)		6,959	USA Sustainment Ammo
	Del Valle	BB	RRF	2 Mar 91	(U-TURN)		2,541	Ammo
	Cumbrian Express	BB	FOR	4 Mar 91	(U-TURN)		5,019	USA Ammo
RIDHAM, UNITED KINGDOM	*Green Ridge*	BB	US	11 Feb 91	(U-TURN)		8,563	USAF Ammo
	John Lykes	BB	US	21 Mar 91	(U-TURN)		8,480	USAF Ammo
SASEBO, JAPAN	*Cleveland*	BB	US	25 Jan 91	9 Feb 91	Al Jubayl	14,399	USAF/USMC Ammo
SUBIC BAY, PHILIPPINES	*Rover*	RO/RO	US	7 Jan 91	20 Jan 91	Ad Damman	10,412	USAF Ammo
	Santa Adela	BB	US	25 Jan 91	11 Feb 91	Al Jubayl	3,671	USAF/USMC Ammo
	Harmony Stove	BB	FOR	22 Feb 91	10 Mar 91	Ad Damman	1,532	USAF Ammo
SUDA BAY, CRETE[2]	*Bettina Danica*[1]	BB	FOR	3 Feb 91	18 Feb 91	Al Jubayl	1,210	USMC Ammo
TENGAN, OKINAWA	*Rover*	RO/RO	US	26 Dec 90	3 Feb 91	Ad Damman	3,650	USAF Ammo
	Santa Adela	BB	US	13 Jan 91	15 Jan 91	Subic Bay	1,749	USMC Ammo
	Cape Catawba	BB	RRF	27 Feb 91	(U-TURN)		3,586	USAF Ammo

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
TOMBOLO,	*Cape Farewell*	LASH	RRF	12 Dec 90	31 Dec 90	Ad Damman	6,297	Ammo
ITALY	*Cape Flattery*	LASH	RRF	13 Jan 91	17 Jan 91	Ad Damman	22,420	USAF Ammo
	Green Harbour	LASH	US (PREPOS)	31 Jan 91	15 Feb 91	Ad Damman	10,848	Ammo
	Austral Lightning	LASH	RRF	24 Feb 91	2 Mar 91	Jeddah	7,655	USAF Ammo
UNKNOWN[3]	*Northern Light*	BB	RRF	10 Feb 91	13 Feb 91	Ad Damman	1,608	Ammo
	Kota Timur	Multi-Purpose	FOR	22 Feb 91	2 Mar 91	Naha, Okinawa	479	Ammo

NOTES:

--During the period 7 August 1990 through 10 March 1991, some ships loaded more than once at the same port. Also some ships loaded at more than one port in the United States or Europe before departing for the US Central Command Area of Responsibility (USCENTCOM AOR).

--This table was compiled from five sources: Military Sealift Command (MSC) Lift Summary Reports, Military Traffic Management Command (MTMC) Port Operations Recap Report, US Transportation Command (USTRANSCOM) Ship Voyage Report, USTRANSCOM Situation Reports (SITREPS), and MSC SITREPS. Each source was cross-referenced with discrepancies footnoted in detail. Information on sources used and footnotes follow.

--This table includes Afloat Prepositioning Force ships in common-user role.

--This table does not include ammunition in Unit Basic Loads carried by sea. (There was also a relatively small amount of ammunition moved via air.)

FOOTNOTES:

1 Ship voyages included on the MSC Lift Summary Report and the USTRANSCOM Ship Voyage Report as cargo loaded and delivered or U-TURN. These ship loadings are not included as cargo loaded on the MTMC Port Operations Recap Report.

2 Bogen, Norway, and Suda Bay, Crete, included as SPOEs on the USTRANSCOM Ship Voyage Report. These ports are not included on the MTMC Port Operations Recap Report. The respective ship voyages reported as cargo loaded at these ports are included on the MSC Lift Summary Report. However, the MSC report does not contain ports by name.

3 Ship voyages included on the MSC Lift Summary Report as cargo loaded and delivered. These ship loadings/voyages are not contained in the MTMC Port Operations Recap Report or the USTRANSCOM Ship Voyage Report. Therefore, names of loading ports cannot be verified.

SOURCES:

The MSC Lift Summary Reports contain all ship loads of dry cargo delivered or U-TURN (cargo loading or en route at the beginning of redeployment on 10 March 1991). They also include ship names, short tons, passengers carried, seaport of embarkation (SPOE) arrival and departure dates, and seaport of debarkation (SPOD) arrival dates. SITREPS provided SPOE or SPOD names. MSC uses the displacement method in computing tonnage, while MTMC and USTRANSCOM use conversion. Therefore, tonnage on the MSC reports will differ from the tonnage on the MTMC and USTRANSCOM reports. Statistics compiled by the USTRANSCOM Research Center have consistently used the MSC tonnage data, i.e., displacement method.

The MTMC Port Operations Recap Report contains all ship loadings of dry cargo by port. The reports include ship name, voyage number, pieces lifted, square feet, short tons (STONS) (conversion), measurement tons (MTONS), super cargoes, and units carried. The MTMC report does not show SPOE arrival and departure dates.

The USTRANSCOM Ship Voyage Report was compiled by the Crisis Action Team during Desert Shield/Desert Storm. This report contains ship voyages to include ship name, unit carried, STONS (conversion), MTONS, passengers, type of ship, SPOE departure date, and SPOD arrival date.

PREPARED BY: US Transportation Command, Research Center (TCRC).

ACRONYMS:

ACR	Armored Cavalry Regiment
AD	Armored Division
BB	Breakbulk
CS	Combat Support
FA BDE	Field Artillery Brigade
FLO/FLO	Float-On/Float-Off
FO	Follow-On Equipment
FOR	Foreign
FSS	Fast Sealift Ship
FSSG	Force Service Support Group
HEMTTs	Heavy Expanded Mobility Tactical Trucks
HETs	Heavy Equipment Transporters
HHC	Headquarters and Headquarters Company
LASH	Lighter Aboard Ship
LO/LO	Lift-On/Lift-Off
MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Force
MI	Military Intelligence
MPS	Maritime Prepositioning Ship
NC	No Charge
POMCUS	Prepositioning of Material Configured to Unit Sets
PREPOS	Prepositioning Ship
RO/RO	Roll-Off/Roll-Off
RRF	Ready Reserve Force
TACS	Crane Ship
T-AVBS	Aviation Logistics Support Ship
UBL	Units of Basic Loan
UE	Unit Equipment
USA	United States Army
USAF	United States Air Force
USAFE	United States Air Force Europe
USMC	United States Marine Corps
USN	United States Navy
VC	Vehicle Carrier

APPENDIX 5

AFLOAT PREPOSITIONING FORCE (APF) ACTIVATION/FIRST VOYAGE

BY SEAPORT OF DEBARKATION (SPOD) ARRIVAL DATE

MARITIME PREPOSITIONING SHIPS (MPS)

SHIP NAME	SHIP TYPE	SQUADRON[1]	ACTIVATION DATE	SPOE/LOCATION AT ACTIVATION	SPOE ARR	SPOE DEP/ U/W TO AOR	SPOD LOCATION	SPOD ARR	STONS	SQ FEET	UNIT SUPPORTED/CARRIED
Anderson[2]	RO/RO	MPS-2	7 Aug 90	Diego Garcia	--	8 Aug 90	Al Jubayl	15 Aug 90	10,270	150,000	7th MEB Eqp & Supplies
Bonnyman[3]	RO/RO	MPS-2	7 Aug 90	Diego Garcia	--	8 Aug 90	Al Jubayl	15 Aug 90	10,174	150,000	7th MEB Eqp & Supplies
Hauge[2]	RO/RO	MPS-2	7 Aug 90	Diego Garcia	--	8 Aug 90	Al Jubayl	15 Aug 90	12,199	150,000	7th MEB Eqp & Supplies
Fisher[2]	RO/RO	MPS-2	7 Aug 90	Diego Garcia[4]	--	8 Aug 90	Al Jubayl	24 Aug 90	9,999	150,000	7th MEB Eqp & Supplies
Williams[5]	RO/RO	MPS-3	7 Aug 90	U/W (Saipan)[6]	--	8 Aug 90	Al Jubayl	25 Aug 90	13,346	150,000	1st MEB Eqp & Supplies
Lopez[2]	RO/RO	MPS-3	7 Aug 90	U/W (Saipan)[6]	--	8 Aug 90	Al Jubayl	26 Aug 90	13,436	150,000	1st MEB Eqp & Supplies
Lummus[7]	RO/RO	MPS-3	7 Aug 90	U/W (Saipan)[6]	--	8 Aug 90	Al Jubayl	26 Aug 90	13,202	150,000	1st MEB Eqp & Supplies
Button[5]	RO/RO	MPS-3	7 Aug 90	U/W (Saipan)[6]	--	8 Aug 90	Al Jubayl	30 Aug 90	12,701	150,000	1st MEB Eqp & Supplies
Baugh[3]	RO/RO	MPS-2	7 Aug 90	Jacksonville, FL[8]	--	10 Aug 90	Al Jubayl	5 Sep 90	10,400	150,000	7th MEB Eqp & Supplies
Bobo[9]	RO/RO	MPS-1	10 Nov 90	Morehead Cy, NC	13 Nov 90	14 Nov 90	Al Jubayl	13 Dec 90	14,416	150,000	II MEF
Kocak[9]	RO/RO	MPS-1	10 Nov 90	Morehead Cy, NC	13 Nov 90	14 Nov 90	Al Jubayl	13 Dec 90	14,437	150,000	II MEF
Obregon[9]	RO/RO	MPS-1	10 Nov 90	Morehead Cy, NC	13 Nov 90	14 Nov 90	Al Jubayl	13 Dec 90	15,523	150,000	II MEF
Pless[9]	RO/RO	MPS-1	10 Nov 90	Morehead Cy, NC	13 Nov 90	14 Nov 90	Al Jubayl	13 Dec 90	14,225	150,000	II MEF

FOOTNOTES:

1 The Maritime Prepositioning Ships (MPS) consisted of 13 ships organized into three MPS Squadrons: MPS-1 under operational control of the Commander in Chief, Atlantic Fleet was located in the eastern Atlantic. MPS-2, home ported at Diego Garcia, and MPS-3, home ported at Guam, were under operational control of the Commander in Chief, Pacific Fleet. They are contractor-owned and-operated, crewed by merchant mariners, and support the US Marine Corps.

2 Released for common-user service: *Anderson* arrived Newport News, VA, 18 Sep 90; *Hauge* arrived Charleston, SC, 23 Sep 90; *Fisher* arrived Houston, TX, 30 Sep 90; *Lopez* arrived Jacksonville, FL, 15 Oct 90; and *Pless* arrived Rotterdam, Netherlands, 4 Jan 91.

3 *Bonnyman* and *Baugh* released for common-user service arriving Jacksonville, FL, 22 Sep 90 and Charleston, SC, 4 Oct 90, respectively. After these voyages, *Bonnyman* and *Baugh* transferred to US Central Command operational control in November 90 and remained in that status through the end of Desert Storm.

4 Activated while off-station in vicinity of the Cape of Good Hope, en route to the US for a routine maintenance cycle.

5 *Williams* and *Button* remained intheater as floating ammunition and fuel platforms.

6 MPS-3 was operating in the Mariana Islands at time of activation notice.

7 *Lummus* arrived Pearl Harbor, HI, 10 Oct 90 and remained until directed to commence reconstitution on 16 Oct 90 when it proceeded to various Western Pacific ports for material. After picking up cargo at Sasebo, Japan; Naha, Okinawa; and Subic Bay, Philippines; *Lummus* returned to Guam on 8 Dec 90, and remained there through Desert Storm.

8 Activated while undergoing maintenance cycle at Blount Island, Jacksonville, FL.

9 *Bobo*, *Kocak*, and *Obregon* retained for intheater shipping requirements.

SOURCE: Military Sealift Command (MSC) Lift Summary Reports; History (U), History of MSC during Operation Desert Shield/Desert Storm, CAPT Harold S. Tiernan, 16 Jul 91.

ACRONYMS:

MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Force
RO/RO	Roll-On/Roll-Off
SPOE	Seaport of Embarkation
STONS	Short Tons

APPENDIX 6

AFLOAT PREPOSITIONING FORCE (APF) ACTIVATION/FIRST VOYAGE BY SEAPORT OF DEBARKATION (SPOD) ARRIVAL DATE

PREPOSITIONING SHIPS (PREPOS)

SHIP NAME	SHIP TYPE	SQUADRON[1]	ACTIVATION DATE	SPOE/LOCATION AT ACTIVATION	SPOE ARR	SPOE DEP/ U/W TO AOR	SPOD LOCATION	SPOD ARR	STONS	SQ FEET	UNIT SUPPORTED/CARRIED
Austral Rainbow[2]	LASH	MPSRON-2	8 Aug 90	Diego Garcia	--	9 Aug 90	Ad Damman	17 Aug 90	22,652	147,378	USA/AF Eqp & Supplies
Green Harbour[2]	LASH	MPSRON-2	8 Aug 90	Diego Garcia	--	9 Aug 90	Ad Damman	17 Aug 90	20,494	162,690	USA/AF Eqp & Supplies
Green Island[2]	LASH	MPSRON-2	8 Aug 90	Diego Garcia	--	9 Aug 90	Ad Damman	17 Aug 90	24,389	170,346	USA/AF Eqp & Supplies
American Cormorant[2]	FLO/FLO	MPSRON-2	8 Aug 90	Diego Garcia	--	9 Aug 90	Ad Damman	18 Aug 90	6,918	Unknown	USA/AF Eqp & Supplies
Santa Victoria[3]	BB	MPSRON-2	8 Aug 90	Diego Garcia	--	9 Aug 90	Ad Damman	18 Aug 90	9,617	75,323	USA/AF Eqp & Supplies
American Kestrel[2]	LASH	MPSRON-2	8 Aug 90	Diego Garcia	--	9 Aug 90	Abu Dhabi	19 Aug 90	20,063	147,378	USA/AF Eqp & Supplies
Advantage[2]	BB	MPSRON-2	8 Aug 90	Villefranche, FR[4]	--	9 Aug 90	Jeddah	20 Aug 90	9,410	114,040	USA/AF Eqp & Supplies
Noble Star[2]	BB	MPSRON-2	8 Aug 90	Diego Garcia	--	9 Aug 90	Ad Damman	21 Aug 90	3,434	72,730	USA/AF Eqp & Supplies
Overseas Alice[5]	Tanker	MPSRON-2	8 Aug 90	Diego Garcia							
Sealift Pacific[6]	Tanker	MPSRON-2	8 Aug 90	Diego Garcia							
Overseas Valdez[7]	Tanker	MPSRON-2	8 Aug 90	Diego Garcia							
Overseas Vivian[7]	Tanker	MPSRON-2	8 Aug 90	Diego Garcia							

APPENDIX 6 (Con't)

FOOTNOTES:

1 The Prepositioning Ships (PREPOS), contractor-owned and -operated and crewed by merchant mariners, support the Army, Navy, and Air Force. They are administratively controlled by Maritime Prepositioning Ship Squadron Two at Diego Garcia.

2 Released for common-user service: *Austral Rainbow* arrived Long Beach, CA, 6 Oct 90; *Green Harbour* arrived Sunny Point, NC, 4 Oct 90; *Green Island* arrived Sunny Point, NC, 31 Oct 90; *American Kestral* arrived Sunny Point, NC, 26 Dec 90; *Noble Star* arrived Livorno, IT, 9 Sep 90; *Advantage* arrived Nordenham, GE, 24 Jan 91; and *American Cormorant* arrived Norfolk, VA, 20 Jan 91.

3 Off-hire after initial delivery through Jan 91 for major boiler repairs; remained under US Central Command operational command throughout Desert Storm; was not released for common-user service.

4 Stationed in the Western Mediterranean under the control of the Commander, Military Sealift Command Mediterranean at the start of Operation Desert Shield.

5 Arrived Gulf of Oman on 16 Aug 90; completed first common-user voyage by mid-Jan 91.

6 Arrived Red Sea on 17 Aug 90; assigned to the delivery of petroleum, oil, and lubricants (POL) to fleet oilers in the area; completed first common-user voyage by mid-Jan 91.

7 Withdrawn for common-user service at the recommendation of the Commander, Military Sealift Command, at the outset of Desert Shield.

SOURCE: Military Sealift Command (MSC) Lift Summary Reports; History (U), History of MSC during Operation Desert Shield/Desert Storm, CAPT Harold S. Tiernan, 16 Jul 91.

ACRONYMS:

BB	Breakbulk
Eqp	Equipment
FLO/FLO	Float-On/Float-Off
LASH	Lighter Aboard Ship
MPSRON	Maritime Prepositioning Ship Squadron
SPOE	Seaport of Embarkation
STONS	Short Tons
USA	United States Army
USAF	United States Air Force

APPENDIX 7

FAST SEALIFT SHIPS (FSSs) ACTIVATION/FIRST VOYAGE BY SEAPORT OF DEBARKATION (SPOD) ARRIVAL DATE

SHIP NAME	SHIP TYPE	LAYBERTH	ACTIVATION DATE	SPOE LOCATION	SPOE ARR	SPOE DEP	SPOD LOCATION	SPOD ARR	BREAKOUT STD TIME	BREAKOUT TIME	TIME LOST[1]	STONS	SQ FT	UNIT CARRIED
Capella	RO/RO	Jacksonville, FL	7 Aug 90	Savannah, GA	11 Aug 90	13 Aug 90	Ad Damman	27 Aug 90	96 Hours	65 Hours	10 Days	15,477	129,797	24th INF DIV
Altair	RO/RO	Hampton Rds, VA	7 Aug 90	Savannah, GA	11 Aug 90	14 Aug 90	Ad Damman	28 Aug 90	96 Hours	68 Hours	5 Hours	12,763	109,205	24th INF DIV
Regulus	RO/RO	Violet, LA	7 Aug 90	Savannah, GA	13 Aug 90	16 Aug 90	Ad Damman	31 Aug 90	96 Hours	80 Hours	2 Days	10,856	106,680	24th INF DIV
Bellatrix	RO/RO	Galveston, TX	8 Aug 90	Savannah, GA	12 Aug 90	15 Aug 90	Ad Damman	1 Sep 90	96 Hours	33 Hours	0	6,634	125,455	24th INF DIV
Pollux	RO/RO	Violet, LA	8 Aug 90	Wilmington, NC	13 Aug 90	16 Aug 90	Ad Damman	31 Aug 90	96 Hours	83 Hours	3 Days	10,279	119,974	1st COSCOM
Algol	RO/RO	Galveston, TX	8 Aug 90	Savannah, GA	14 Aug 90	18 Aug 90	Ad Damman	5 Sep 90	96 Hours	79 Hours	8 Days	13,782	160,673	24th INF DIV
Denebola	RO/RO	Bayonne, NJ	8 Aug 90	Savannah, GA	20 Aug 90	22 Aug 90	Ad Damman	7 Sep 90	96 Hours	10 Days[2]	11 Days	14,253	129,083	24th INF DIV
Antares	RO/RO	Jacksonville, FL	8 Aug 90	Savannah, GA	16 Aug 90	20 Aug 90	Rota, SP	9 Sep 90	96 Hours	157 Hours[3]	NA	7,280	117,407	24th INF DIV

FOOTNOTES:

1 Lost time due to unscheduled repairs.
2 The *Denebola* was undergoing repairs in Bayonne, NJ, at time of activation.
3 Late breakout of *Antares* due to engine and boiler problems that eventually caused her to be taken out of service midway through her first voyage. The *Antares* was towed to Rota, SP, and her cargo was transloaded to the *Altair* for delivery to the AOR on 23 Sep 90.

SOURCE: Military Sealift Command (MSC) Lift Summary Reports; History (U), History of MSC during Operation Desert Shield/Desert Storm, CAPT Harold S. Tiernan, 16 Jul 91.

ACRONYMS:

AOR	Area of Responsibility
COSCOM	Corps Support Command
INF DIV	Infantry Division
RO/RO	Roll-On/Roll-Off
SPOE	Seaport of Embarkation

APPENDIX 8

READY RESERVE FORCE (RRF) ACTIVATION/FIRST VOYAGE

BY SEAPORT OF DEBARKATION (SPOD) ARRIVAL DATE

SHIP NAME	SHIP TYPE	RESERVE FLEET	ACTIVATION DATE	TENDER DATE	SPOE LOCATION	SPOE ARR	SPOE DEP	SPOD LOCATION	SPOD ARR	BREAK-OUT	DAYS LATE	STONS	SQ FT	LOAD
Cape Henry	RO/RO	James River	10 Aug 90	15 Aug 90	Wilmington, NC	17 Aug 90	20 Aug 90	Ad Damman	9 Sep 90	5	0	12,930	129,633	1 COSCOM
Cape Inscription[1]	RO/RO	Beaumont	10 Aug 90	15 Aug 90	Savannah, GA	15 Aug 90	20 Aug 90	Ad Damman	9 Sep 90	5	0	4,109	99,741	197 INF BDE
Cape Hudson	RO/RO	James River	10 Aug 90	15 Aug 90	Savannah, GA	19 Aug 90	21 Aug 90	Ad Damman	16 Sep 90	5	0	11,352	157,704	197 INF BDE
Cape Lobos	RO/RO	James River	10 Aug 90	18 Aug 90	Jacksonville, FL	19 Aug 90	21 Aug 90	Ad Damman	16 Sep 90	5	3	6,339	68,143	101 ABN DIV
Adm Callaghan	RO/RO	James River	10 Aug 90	26 Aug 90	Jacksonville, FL	27 Aug 90	29 Aug 90	Ad Damman	17 Sep 90	20	0	3,734	114,042	101 ABN DIV
Equality State[2]	TACS	Beaumont	20 Aug 90	31 Aug 90	Bayonne, NJ	9 Sep 90	12 Sep 90	Rota, SP	23 Sep 90	5	6	2,253	34,202	46/85 MED BN
Cape May	SeaBee	Beaumont	14 Aug 90	22 Aug 90	Wilmington, NC	25 Aug 90	30 Aug 90	Ad Damman	24 Sep 90	5	3	7,256	80,483	XVIII ABN CO
Cape Mohican	SeaBee	James River	14 Aug 90	21 Aug 90	Jacksonville FL	22 Aug 90	1 Sep 90	Ad Damman	24 Sep 90	5	2	4,017	64,938	101 ABN DIV
Cape Juby	BB	James River	18 Aug 90	28 Aug 90	Jacksonville FL	31 Aug 90	4 Sep 90	Ad Damman	25 Sep 90	5	5	1,108	39,154	101 ABN DIV
Cape Decision	RO/RO	James River	10 Aug 90	29 Aug 90	Wilmington, NC	29 Aug 90	1 Sep 90	Ad Damman	26 Sep 90	5	14	15,885	133,000	XVIII ABN CO
Cape Clear	BB	Beaumont	18 Aug 90	24 Aug 90	Houston ,TX	25 Aug 90	1 Sep 90	Ad Damman	27 Sep 90	10	0	1,943	34,601	III CORPS
Cape Isabel	RO/RO	Suisun Bay	10 Aug 90	21 Aug 90	Wilmington, NC	3 Sep 90	7 Sep 90	Ad Damman	28 Sep 90	5	6	7,492	76,910	1 COSCOM
Cornhusker State	TACS	James River	20 Aug 90	7 Sep 90	Bayonne, NJ	7 Sep 90	10 Sep 90	Ad Damman	28 Sep 90	5	13	4,316	45,569	CS/CSS
Jupiter	RO/RO	Suisun Bay	10 Aug 90	20 Aug 90	Houston, TX	3 Sep 90	5 Sep 90	Ad Damman	28 Sep 90	5	5	2, 916	58,974	13 COSCOM
Cape Mendocino[2]	SeaBee	Beaumont	30 Aug 90	3 Sep 90	Houston, TX	5 Sep 90	8 Sep 90	Rota, SP	30 Sep 90	5	0	2,809	66,176	212 FA BDE
Cape Catoche[3]	BB	James River	18 Aug 90	30 Aug 90	Charleston, SC	31 Aug 90	4 Sep 90	Jacksonville, FL	4 Sep 90	5	7	794	30,000	XVIII ABN CO
					Jacksonville, FL	4 Sep 90	7 Sep 90	Ad Damman	30 Sep 90			1,225	14,976	101 ABN DIV
Cape Horn	RO/RO	Suisun Bay	10 Aug 90	19 Aug 90	Beaumont, TX	1 Sep 90	5 Sep 90	Ad Damman	1 Oct 90	5	4	13,115	166,667	3 ACR
Cape Ducato	RO/RO	Suisun Bay	10 Aug 90	24 Aug 90	Beaumont, TX	6 Sep 90	7 Sep 90	Ad Damman	2 Oct 90	5	9	10,461	112,835	3 ACR
Gulf Trader	BB	Beaumont	20 Aug 90	1 Sep 90	Beaumont, TX	1 Sep 90	6 Sep 90	Ad Damman	2 Oct 90	5	7	2,069	43,077	3 ACR

APPENDIX 8 (Con't)

SHIP NAME	SHIP TYPE	RESERVE FLEET	ACTIVATION DATE	TENDER DATE	SPOE LOCATION	SPOE ARR	SPOE DEP	SPOD LOCATION	SPOD ARR	BREAK-OUT	DAYS LATE	STONS	SQ FT	LOAD
Cape Flattery	LASH	Beaumont	14 Aug 90	20 Aug 90	Wilmington, NC	6 Sep 90	11 Sep 90	Ad Damman	4 Oct 90	5	1	10,844	170,346	1 COSCOM
Cape Farewell	LASH	Beaumont	14 Aug 90	19 Aug 90	Wilmington, NC	6 Sep 90	10 Sep 90	Ad Damman	5 Oct 90	5	0	7,903	170,346	1 COSCOM
Meteor	RO/RO	Suisun Bay	10 Aug 90	25 Aug 90	Beaumont, TX	7 Sep 90	10 Sep 90	Ad Damman	5 Oct 90	5	10	2,943	71,229	1 COSCOM
Cape Edmont	RO/RO	Suisun Bay	10 Aug 90	24 Aug 90	Houston, TX	7 Sep 90	9 Sep 90	Ad Damman	10 Oct 90	5	9	5,173	115,146	57 SIG BDE
Cape Domingo[4]	RO/RO	James River	10 Aug 90	18 Aug 90	Sunny Point, NC Al Fujayrah	17 Aug 90 17 Sep 90	23 Aug 90 11 Oct 90	Al Fujayrah Al Jubayl	17 Sep 90 13 Oct 90	5	3	17,116	124,825	4 MEB
Washington[5]	Seatrain	Beaumont	20 Aug 90	29 Aug 90	Jacksonville, FL	30 Sep 90	2 Oct 90	Rota, SP	14 Oct 90	10	0	2,760	56,139	1 COSCOM
Cape Breton	BB	Suisun Bay	20 Aug 90	25 Aug 90	Concord, CA	29 Aug 90	14 Sep 90	Al Jubayl	14 Oct 90	5	0	9,280	42,075	Ammunition
Comet	RO/RO	Suisun Bay	10 Aug 90	25 Aug 90	Beaumont, TX	12 Sep 90	18 Sep 90	Ad Damman	14 Oct 90	5	10	3,880	63,046	1 BDE 2 ARMD DIV
Cape Nome	BB	James River	20 Aug 90	13 Sep 90	Charleston, SC	15 Sep 90	20 Sep 90	Ad Damman	15 Oct 90	5	19	3,056	55,255	1 COSCOM
Maine	Seatrain	Beaumont	30 Aug 90	12 Sep 90	Houston, TX	13 Sep 90	15 Sep 90	Ad Damman	18 Oct 90	10	3	2,438	52,986	1 CAV DIV
Del Valle	BB	Beaumont	20 Aug 90	14 Sep 90	Jacksonville, FL	18 Sep 90	28 Sep 90	Ad Damman	21 Oct 90	10	15	2,960	53,000	1 COSCOM
Cape Douglas[2]	RO/RO	James River	10 Aug 90	23 Aug 90	Jacksonville, FL Rota, SP	24 Aug 90 17 Sep 90	25 Aug 90 Unknown	Rota, SP Ad Damman	17 Sep 90 22 Oct 90	5	8	15,297	164,442	101 ABN DIV
Cape Borda	BB	Suisun Bay	20 Aug 90	26 Aug 90	Long Beach, CA	4 Sep 90	10 Sep 90	Al Jubayl	25 Oct 90	5	1	1,656	40,675	MEF/SIG BDE
Cape Johnson	BB	James River	18 Aug 90	11 Sep 90	Jacksonville, FL	3 Oct 90	9 Oct 90	Ad Damman	31 Oct 90	5	19	1,257	45,750	1 COSCOM
Cape Gibson	BB	Suisun Bay	21 Sep 90	27 Sep 90	Oakland, CA	28 Sep 90	9 Oct 90	Ad Damman	1 Nov 90	5	1	2,583	45,144	52 ENG BN
Austral Lightning	LASH	Suisun Bay	21 Sep 90	26 Sep 90	Oakland, CA	5 Oct 90	8 Oct 90	Ad Damman	2 Nov 90	5	0	4,510	188,773	1 COSCOM
Cape Lambert	RO/RO	James River	10 Aug 90	9 Oct 90	Jacksonville, FL	11 Oct 90	13 Oct 90	Ad Damman	13 Nov 90	5	55	2,063	47,399	1 COSCOM
Gopher State[6]	TACS	James River	19 Apr 90	24 Nov 90	Oakland, CA	21 Nov 90	4 Dec 90	Ad Damman	31 Dec 90	5	Unknown	2,571	25,153	M2 Force Mod
Gulf Banker[7]	BB	Beaumont	18 Aug 90	15 Nov 90	Beaumont, TX	15 Nov 90	9 Dec 90	Ad Damman	5 Jan 91	10	Unknown	1,037	27,920	216 MED
Diamond State	TACS	Beaumont	4 Dec 90	14 Dec 90	Charleston, SC	18 Dec 90	22 Dec 90	Ad Damman	11 Jan 91	5	5	2,382	41,224	CS/CSS
Cape Florida	LASH	Beaumont	14 Aug 90	18 Oct 90	Sunny Point, NC	24 Oct 90	8 Dec 90	Ad Damman	14 Jan 92	5	60	25,815	127,840	Ammunition

APPENDIX 8 (Con't)

SHIP NAME	SHIP TYPE	RESERVE FLEET	ACTIVATION DATE	TENDER DATE	SPOE LOCATION	SPOE ARR	SPOE DEP	SPOD LOCATION	SPOD ARR	BREAK-OUT	DAYS LATE	STONS	SQ FT	LOAD
Cape Carthage	BB	James River	4 Dec 90	15 Dec 90	Bayonne, NJ	16 Dec 90	21 Dec 90	Ad Damman	15 Jan 91	5	6	6,956	33,687	CSS
Cape Charles	BB	Beaumont	4 Dec 90	12 Dec 90	Wilmington, NC	17 Dec 90	22 Dec 90	Al Jubayl	15 Jan 91	10	0	1,805	36,408	II MEF
Flickertail State[6]	TACS	James River	29 May 90	1 Dec 90	Port Hueneme, CA	26 Nov 90	17 Dec 90	Al Jubayl	15 Jan 91	5	Unknown	2,043	40,590	5 MEB
Cape Girardeau	BB	Suisun Bay	21 Sep 90	26 Sep 90	Port Hueneme, CA	9 Dec 90	23 Dec 90	Khor Fakkan	19 Jan 91	5	0	4,200	Unknown	5 MEB w/Hold
Cape Cod	BB	Beaumont	4 Dec 90	19 Dec 90	Jacksonville, FL	23 Dec 90	27 Dec 90	Ad Damman	20 Jan 91	5	10	1,275	33,117	CSS/HETS
Cape Bover	BB	Suisun Bay	4 Dec 90	9 Dec 90	Oakland, CA	14 Dec 90	22 Dec 90	Ad Damman	21 Jan 91	5	0	2,482	43,550	CS/CSS
Cape Blanco[3]	BB	Suisun Bay	4 Dec 90	9 Dec 90	Oakland, CA	11 Dec 90	15 Dec 90	Tacoma, WA	17 Dec 90	5	0	850	23,280	CS/CSS
					Tacoma, WA	17 Dec 90	22 Dec 90	Ad Damman	22 Jan 91			1,309	33,889	
Cape Catawba	BB	Beaumont	4 Dec 90	19 Dec 90	Beaumont, TX	19 Dec 90	24 Dec 90	Ad Damman	25 Jan 91	10	5	1,877	24,933	CSS
Cape Canso	BB	James River	4 Dec 90	24 Dec 90	Charleston, SC	24 Dec 90	28 Dec 90	Ad Damman	26 Jan 91	5	15	1,146	30,513	CSS
Cape Diamond	RO/RO	James River	10 Aug 90	19 Dec 90	Houston, TX	24 Dec 90	28 Dec 90	Ad Damman	26 Jan 91	5	126	5,780	111,258	1 INF DIV/HET
California	BB	Suisun Bay	4 Dec 90	10 Dec 90	Oakland, CA	10 Dec 90	16 Dec 90	Ad Damman	27 Jan 91	5	1	1,323	29,176	1742 TC CO
Northern Light	BB	Suisun Bay	4 Dec 90	10 Dec 90	Oakland, CA	15 Dec 90	22 Dec 90	Ad Damman	27 Jan 91	5	1	1,025	22,827	US CS/CSS
Cape Bon	BB	Suisun Bay	4 Dec 90	10 Dec 90	Oakland, CA	16 Dec 90	22 Dec 90	Ad Damman	28 Jan 91	5	1	1,872	33,189	250 TC CO
Buyer	BB	Beaumont	25 Jan 91	1 Feb 91	Sunny Point, NC	9 Feb 91	18 Feb 91	Rotterdam, NL	1 Mar 91	5	2	8,647	46,175	Ammunition
Banner[8]	BB	James River	4 Dec 90	21 Jan 91	Jacksonville, FL	23 Jan 91	9 Feb 91	Ad Damman	12 Mar 91	10	38	1,472	38,923	CS/CSS
(U-TURN)					Ad Damman	12 Mar 91	Unknown	Jacksonville, FL	10 Apr 91					
Courier[8]	BB	James River	4 Dec 90	9 Jan 91	Sunny Point, NC	14 Jan 91	25 Jan 91	Ad Damman	Unknown	10	26	9,187	45,935	USMC
(U-TURN)					Ad Damman	Unknown	Unknown	Sunny Point, NC	4 Apr 91					Ammunition
Ambassador[8]	BB	James River	16 Jan 91	26 Jan 91	Cheatham, VA	12 Feb 91	21 Feb 91	Jacksonville, FL	23 Feb 91	10	0	2,890	20,125	USMC Matting
(U-TURN)					Jacksonville, FL	23 Feb 91	8 Mar 91	Cheatham, VA	10 Mar 91					
Lake[8]	BB	James River	4 Dec 90	23 Jan 91	Sunny Point, NC	1 Feb 91	8 Feb 91	Ad Damman	Unknown	5	45	8,150	36,460	USMC/USA
(U-TURN)					Ad Damman	Unknown	Unknown	Sunny Point, NC	31 Mar 91					Ammunition
Pride[8]	BB	James River	4 Dec 90	13 Jan 91	Earle, NJ	27 Jan 91	10 Feb 91	Ad Damman	Unknown	5	35	6,694	31,845	USMC
(U-TURN)					Ad Damman	Unknown	Unknown	Earle, NJ	27 Mar 91					Ammunition

APPENDIX 8 (Con't)

SHIP NAME	SHIP TYPE	RESERVE FLEET	ACTIVATION DATE	TENDER DATE	SPOE LOCATION	SPOE ARR	SPOE DEP	SPOD LOCATION	SPOD ARR	BREAK-OUT	DAYS LATE	STONS	SQ FT	LOAD
Santa Ana[8]	BB	Beaumont	4 Dec 90	10 Jan 91	Sunny Point, NC	19 Feb 91	28 Feb 91	Ad Damman	Unknown	10	27	8,026	43,220	Ammunition
(U-TURN)					Ad Damman	Unknown	Unknown	Sunny Point, NC	1 Mar 91					
Aide[8]	BB	James River	4 Dec 90	26 Feb 91	Al Jubayl	9 Apr 91	27 Apr 91	Pt Heuneme, CA	31 May 91	10	74	4,450	Unknown	II MEF Matting
Scan[9]	BB	James River	4 Dec 90	24 Feb 91	Al Jubayl	28 Mar 91	20 Mar 91	Bremerhaven, GE	11 May 91	5	77	904	27,933	2 ACR
Cape Canaveral[9]	BB	James River	25 Jan 91	2 Feb 91	Unknown	6 Apr 91	13 May 91	Unknown	15 Jul 91	5	3	1,069	Unknown	Unknown
Del Monte[10]	BB	Beaumont	20 Aug 90	18 Nov 90	Sunny Point, NC	29 Mar 91	30 Apr 91	Unknown	21 May 91	5	85	11	1,253	41,023
Ammunition														
Cape Alexander[12]	BB	James River	12 Aug 90	31 Aug 90	Jacksonville, FL	30 Aug 90	4 Sep 90	Ad Damman	1 Oct 90	5	14	781	43,201	101 ABN DIV
Cape Archway[12]	BB	James River	20 Aug 90	3 Sep 90	Sunny Point, NC	3 Sep 90	11 Sep 90	Ad Damman	9 Oct 90	5	9	9,584	41,285	Ammunition
Cape Ann[12]	BB	James River	9 Nov 90	17 Nov 90	--	--	--	--	--	5	3	--	--	--
Agent[12]	BB	James River	8 Dec 90	7 Jan 91	--	--	--	--	--	5	25	--	--	--
Cape Alava[12]	BB	James River	8 Dec 90	11 Jan 91	--	--	--	--	--	5	29	--	--	--
Cape Avinof[12]	BB	James River	3 Jan 91	29 Jan 91	--	--	--	--	--	5	21	--	--	--
American Osprey[13]	OPDS	Beaumont	31 Aug 90	11 Sep 90	--	--	--	--	--	5	6	--	--	--
Potomac[13]	OPDS	Beaumont	8 Dec 90	19 Dec 90	--	--	--	--	--	5	6	--	--	--
Gulf Merchant[14]	BB	Beaumont	4 Mar 91	4 Mar 91	--	--	--	--	--	10	0	--	--	--
Gulf Shipper[14]	BB	Beaumont	5 Mar 91	5 Mar 91	--	--	--	--	--	5	0	--	--	--
MSN Buenaventura[15]	Tanker	Beaumont	5 Feb 91	9 Feb 91	--	--	--	--	--	5	0	--	--	--
MSN Capistrano[15]	Tanker	Beaumont	22 Feb 91	25 Mar 91	--	--	--	--	--	5	26	--	--	--
American Explorer[15]	Tanker	Beaumont	22 Feb 91	28 Feb 91	--	--	--	--	--	10	0	--	--	--
Shoeshone[15]	Tanker	Beaumont	22 Feb 91	24 Feb 91	--	--	--	--	--	10	0	--	--	--

APPENDIX 8 (Con't)

FOOTNOTES:

1 *Cape Inscription* diverted from Jacksonville, FL, to Savannah, GA, to support the Fast Sealift Ships in deployment of 24th Infantry Division cargo.

2 *Cape Mendocino* at Rota, SP, 30 Sep-7 Oct 90 for boiler repairs; cargo transloaded to *Cape Douglas* and delivered to Ad Damman 22 Oct 90.

3 Loaded cargo at two ports before departing for Persian Gulf.

4 *Cape Domingo* anchored at Al Fujayrah 17 Sep-11 Oct 90; arrived Al Jubayl 13 Oct 90.

5 First loading of *Washington* in Sep 90 at Houston, TX, with 75th Field Artillery Brigade cargo. Due to engine problems, cargo transloaded to *American Condor* at Jacksonville, FL, along with the *Gulf Banker's* 3d Armored Cavalry Regiment cargo. *Washington* returned to the Maritime Administration (MARAD) 21 Sep 90 for repairs. After repairs, *Washington* departed Jacksonville, FL, on 2 Oct 90 and arrived Rota, SP, 14 Oct 90 for boiler repairs. Cargo was transloaded to *Ashley Lykes* and *Lopez* and delivered to Ad Damman 10 Nov 90.

6 *Gopher State* and *Flickertail State* activated 19 Apr and 29 May 90 for modifications in support of Operation Steel Box, which was completed 18 Nov 90.

7 First successful voyage for the *Gulf Banker*. Ten hours after *Gulf Banker* left Beaumont, TX, in Sep 90, loaded with 3d Armored Cavalry Regiment cargo, she lost power and had to be towed back to port. After emergency engine repairs, *Gulf Banker's* next destination was Florida where her cargo was transloaded to the *American Condor* on 20 Sep 90. *Gulf Banker* redelivered to MARAD from the Commander, Military Sealift Command effective 21 Sep 90 and underwent extensive repairs. On 9 Dec 90, *Gulf Banker* finally set sail for the Middle East.

8 U-TURNS: Seaport of Debarkation arrival scheduled after end of war on 10 Mar 91. Ships did not unload in the US Central Command Area of Responsibility (USCENTCOM AOR) and in some cases did not arrive in the AOR before returning to the continental United States.

9 Did not participate in Desert Shield/Desert Storm. First voyage was in support of Desert Sortie (Redeployment).

10 A critical water leak in the main feed pumps was discovered on the *Del Monte* while loading Combat Service Support/Heavy Equipment Transporter cargo at Beaumont, TX, for first voyage to AOR. Cargo transloaded to the *Ponce* at Jacksonville, FL. *Ponce* delivered 6,198 short tons of cargo to Ad Damman on 22 Jan 91. *Del Monte* returned to MARAD and underwent extensive repairs during Desert Shield/Desert Storm time period. The *Del Monte's* first voyage was in support of Desert Sortie (Redeployment).

11 The *Del Monte* was 43 days late breaking out from 20 Aug 90 activation. Returned to MARAD Dec 90 through Mar 91 for repairs.

12 Not used for common-user service. Assigned to Combat Logistics Force (CLF). Provided intheater logistics support--fuel, ammunition, provisions, repair parts and consumables--to Navy fleet units so they could remain on station. *Cape Archway* assigned to CLF 10 Nov 90 and *Cape Alexander* assigned to CLF 21 Dec 90.

13 OPDS Tankers loaded with petroleum, oil, and lubricants (POL) in PREPO status.

14 Activated in Reduced Operating Status (ROS); never used in support of Desert Shield/Desert Storm.

15 MARAD test activation; never used in Desert Shield/Desert Storm.

APPENDIX 8 (Con't)

SUMMARY:

76 RRF Ships activated during Desert Shield/Desert Storm (7 August 1990-10 March 1991).

PLUS:	2 TACS (*Gopher State* and *Flickertail State*) activated prior to Desert Shield/Desert Storm in support of Operation Steel Box; used in support of Desert Shield/Desert Storm.
MINUS:	2 Cargo (*Gulf Merchant* and *Gulf Shipper*) - Remained in ROS status.
MINUS:	4 Tankers (MSN *Buenaventura*, MSN *Capistrano*, *American Explorer*, and *Shoshone*) - MARAD Test activation; never used for Desert Shield/Desert Storm.
EQUALS:	72 RRF ships were activated for use in Desert Shield/Desert Storm.
MINUS:	2 Tankers (*American Osprey* and *Potomac*) loaded with POL remained in prepo status.
EQUALS:	70 RRF dry cargo ships were activated for use in Desert Shield/Desert Storm. (Includes 2 dry cargo (*Cape Alexander* and *Cape Archway*) that participated in support of Desert Shield/Desert Storm before assignment to CLF.)
MINUS:	4 CLF (*Cape Ann*, *Cape Agent*, *Cape Alava*, and *Avinof*) - not common-user; direct support of Navy.
MINUS:	4 RRF common-user dry cargo (*Aide*, *Scan*, *Cape Canaveral*, and *Del Monte*) used in support of Desert Sortie (Redeployment).
EQUALS:	62 RRF common-user dry cargo ships were used in Desert Shield/Desert Storm.

SOURCES: Military Sealift Command (MSC) Lift Summary Reports; MSC Situation Reports (SITREPs); History (U), History of MSC during Operation Desert Shield/Desert Storm, CAPT Harold S. Tiernan, 16 Jul 91; Ready Reserve Force (RRF) Activation Analysis Final Report, US Transportation Command Desert Shield/Desert Storm Ship Voyage Report.

APPENDIX 8 (Con't)

ACRONYMS:

ABN	Airborne
ACR	Armored Cavalry Regiment
ARMD DIV	Armored Division
BB	Breakbulk
BDE	Brigade
CAV	Cavalry
COSCOM	Corps Support Command
CS/CSS	Combat Support/Combat Service Support
CSS/HETS	Combat Service Support/Heavy Equipment Transporters
ENG BN	Engineering Battalion
FA BDE	Field Artillery Brigade
INF DIV/HETS	Infantry Division/Heavy Equipment Transporters
INF BDE	Infantry Brigade
LASH	Lighter Aboard Ship
MEB	Marine Expeditionary Brigade
MED BN	Medical Battalion
MEF	Marine Expeditionary Force
OPDS	Tanker
RO/RO	Roll-On/Roll-Off
SeaBee	Cargo Barge Carriers
Seatrain	Railroad Car Carriers
SIG BDE	Signal Brigade
SPOD	Seaport of Debarkation
SPOE	Seaport of Embarkation
STONS	Short Tons
TACS	Crane Ship
TC CO	Transportation Corps Company
USA	United States Army
USMC	United States Marine Corps

APPENDIX 9

SUMMARY OF DESERT SHIELD/DESERT STORM SEAPORTS OF EMBARKATION ACTIVITY

(7 August 1990 - 10 March 1991)

US PORTS

PORT	NUMBER OF SHIPS*	TOTAL STONS (DRY CARGO)	MAJOR UNITS/LOADS
Bayonne, New Jersey	33	157,394	1st Corps Support Command
Beaumont, Texas	18	87,101[1]	3d ACR, 1st BDE, 2d ARMD DIV
Charleston, South Carolina	14	46,957	XVIII ABN CORPS, 1st COSCOM
Cheatham Annex, Virginia	2	7,789	II Marine Expeditionary Force
Concord, California	9	68,361	Ammunition
Earle, New Jersey	2	11,701	Ammunition
Guam	4	26,938	Ammunition
Gulfport, Mississippi	1	3,398	Navy Construction Battalion 4
Houston, Texas	40	213,648	1st INF DIV, 13th COSCOM, 1st CAV DIV, III CORPS
Jacksonville, Florida	59	220,653[1]	101st ABN DIV, 1st COSCOM, II MEF
Long Beach, California	17	39,538	I MEF, II MEF/5th MEB
Lualualei, Hawaii	1	4,852	Ammunition
Morehead City, North Carolina	7	13,054	II Marine Expeditionary Force
Newport News, Virginia	11	56,243	85th EVAC, 1st COSCOM/7th GRP
Norfolk, Virginia[3]	1	5,700	Landing Craft Utility/Lash Barges
Oakland MOTBA, California	19	42,380	1st COSCOM
Port Hueneme, California	12[2]	31,741	11th SIG BDE, Navy UE, 5th MEB
Roosevelt Roads, Puerto Rico	1	1,880	Navy Unit Equipment
South Atlantic Outport, South Carolina	2	3,534	XVIII Airborne Corps
Savannah, Georgia	12	114,987	24 INF DIV, 197 INF BDE
Sunny Point MOT, North Carolina	38	375,892	4th MEB, Ammunition
Tacoma, Washington	5	11,884	9th INF DIV, 864 ENG BN
Wilmington, North Carolina	22	132,501	II MEF, XVIII ABN CORPS, 1st COSCOM
TOTAL	330	1,678,126	
TOTAL NUMBER OF US PORTS:	23		

FOREIGN PORTS

PORT	NUMBER OF SHIPS*	TOTAL STONS (DRY CARGO)	MAJOR UNITS/LOADS
Amsterdam, Netherlands	5	30,341	Ammunition
Antwerp, Belgium	32	103,463	2d COSCOM, 3d ARMD DIV
Benelux (Near Rotterdam)	1	1,102	12th CMBT AVN BDE
Bogen, Norway[3]	1	3,708	Fleet Hosp 15
Bremerhaven, Germany	48	268,883	2d ACR, VII CORPS, 1st ARMD DIV
Cartagena, Spain	1	5,455	Ammunition
Chinae, Korea	2	11,754	Ammunition
Eemshaven, Netherlands	5	29,990	Ammunition
Emden, Netherlands	2	15,062	Ammunition
Gibraltar, Spain	1	5,040	Follow-On
Glen Douglas, Scotland	1	6,204	Ammunition
Lisbon, Portugal	2	14,226	Ammunition
Livorno, Italy	13	35,888	12th Aviation Brigade
Naha, Okinawa	2	8,185	Navy Unit Equipment
Newport, Wales	2	23,205	Ammunition
Nordenham, Germany	24	154,142	Ammunition
Pusan, Korea	1	3,205	US Air Force Matting
Rota, Spain	4	15,102	1st COSCOM, 24th INF DIV, 75 FA BDE
Ridham, United Kingdom	2	17,043	Ammunition
Rotterdam, Netherlands	41	151,140	2d COSCOM, 3d ARMD DIV
Sasebo, Japan	1	14,399	Ammunition
Southampton, United Kingdom	1	647	Fuel Barges
Subic Bay, Philippines	3	15,615	Ammunition
Suda Bay, Crete[3]	1[2]	1,210	Ammunition
Tengan, Okinawa	3	8,985	Ammunition
Tombolo, Italy	4	47,220	Ammunition
Unknown[4]	4	11,822	Unknown
TOTAL	207	1,003,036	
TOTAL FOREIGN PORTS:	27		
CONUS TOTAL:	330	1,678,126	PORTS: 23
FOREIGN TOTAL:	207	1,003,036	PORTS: 27
GRAND TOTAL:	537	2,681,162	50

* During Desert Shield/Desert Storm some ships loaded more than one time at the same port. For detailed ship/port activity see "Desert Shield/Desert Storm Ship Activity by Port (US and Foreign)," Appendix 10.

FOOTNOTES:

1 *Gulf Banker* cargo transloaded to *American Condor* in Jacksonville, FL, along with the *Washington* cargo, a total of 3,915 short tons. Tonnage for the *Gulf Banker* and *Washington* prior to transloading cannot be verified using the available sources. The *Del Monte* cargo, 6,198 short tons, loaded at Beaumont, TX, was transloaded to the *Ponce* in Jacksonville, FL. See "Desert Shield/Desert Storm Ship Activity by Port (US and Foreign)," Appendix 10.

2 Some ship voyages are included on the MSC and USTRANSCOM reports but are not included on the Military Traffic Management Command (MTMC) report. These include *Flickertail State*, *Cape Girardeau*, and *Nepture Iolite* at Port Hueneme, CA, and *Bettina Danica* at Suda Bay, Crete. See "Desert Shield/Desert Storm Ship Activity by Port (US and Foreign)," Appendix 10.

3 Bogen, Norway, and Suda Bay, Crete, included as loading ports on US Transportation Command (USTRANSCOM) report. These ports are not included in the MTMC report. The respective ship voyages are included as cargo loaded on the Military Sealift Command (MSC) report; however, the MSC report does not list ports by name. See "Desert Shield/Desert Storm Ship Activity by Port (US and Foreign)," Appendix 10.

4 *Santania*, *Super Servant 3*, *Northern Light*, and *Kota Timur* included as ship voyages on the MSC report. These ship loadings/voyages are not included on the MTMC report or the USTRANSCOM report; therefore, name of ports for these voyages cannot be verified using the three available sources.

SOURCES: Military Sealift Command Lift Summary Reports, Military Traffic Management Command Port Operations Recap Report, US Transportation Command Ship Voyage Report.

ACRONYMS:

ABN DIV	Airborne Division	GRP	Group
ACR	Armored Cavalry Regiment	INF BDE	Infantry Brigade
ARMD DIV	Armored Division	INF DIV	Infantry Division
BDE	Brigade	MEB	Marine Expeditionary Brigade
CAV DIV	Cavalry Division	MEF	Marine Expeditionary Force
CMBT AVN BDE	Combat Aviation Brigade	MOT	Military Ocean Terminal
COSCOM	Corps Support Command	MOTBA	Military Ocean Terminal Bay Area
ENG BN	Engineering Battalion	NMCB	Navy Mobile Construction Battalion
EVAC	Evacuation	SIG BDE	Signal Brigade
FA BDE	Field Artillery Brigade	UE	Unit Equipment

APPENDIX 10

DESERT SHIELD/DESERT STORM SHIP ACTIVITY BY PORT (US AND FOREIGN)

(7 August 1990 - 10 March 1991)

US PORTS

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
BAYONNE, NJ	*Cornhusker State*	TACS	RRF	10 Sep 90	28 Sep 90	Ad Damman	4,316	CS/Combat Svc Spt
	Equality State[1]	TACS	RRF	12 Sep 90	DIW	Ad Damman	2,253	46/85 Medical BN
	Marine Reliance	RO/RO	US	18 Sep 90	9 Oct 90	Ad Damman	3,600	1st COSCOM
	Canadian Forest	RO/RO	FOR	5 Oct 90	28 Oct 90	Ad Damman	3,979	1st COSCOM
	Cape Lobos	RO/RO	RRF	19 Oct 90	14 Nov 90	Ad Damman	2,763	1st COSCOM
	ASL *Cygnus*	RO/RO	FOR	22 Oct 90	13 Nov 90	Ad Damman	4,125	1st COSCOM
	Cape Decision	RO/RO	RRF	25 Oct 90	15 Nov 90	Ad Damman	4,665	1st COSCOM
	Cape Horn	RO/RO	RRF	27 Oct 90	23 Nov 90	Ad Damman	5,062	1st COSCOM
	Capella	RO/RO	FSS	29 Oct 90	14 Nov 90	Ad Damman	7,867	1st COSCOM
	Pollux	RO/RO	FSS	5 Nov 90	19 Nov 90	Ad Damman	2,868	1st COSCOM
	Saudi Hofuf	RO/RO	FOR	26 Nov 90	19 Dec 90	Ad Damman	3,060	1st COSCOM
	Lash Alantico	LASH	US	2 Dec 90	23 Dec 90	Ad Damman	5,747	FO/656 Trans Corps Co
	Gulf Trader	BB	RRF	7 Dec 90	29 Dec 90	Ad Damman	1,570	542 Trans Corps Co
	Oslo (Bassro) Polar	RO/RO	FOR	10 Dec 90	10 Jan 91	Ad Damman	3,034	Combat Svc Spt & 18 HETs
	Merzario Brittania	RO/RO	FOR	13 Dec 90	9 Jan 91	Ad Damman	5,017	II MEF
	Anangel Apollo	BB	FOR	14 Dec 90	14 Jan 91	Ad Damman	2,306	890th Trans Corps, 1486 CS
	Stonewall Jackson	LASH	US	16 Dec 90	14 Jan 91	Unknown	755	Barges
	Cape Lambert	RO/RO	RRF	19 Dec 90	5 Jan 91	Ad Damman	11,355	1st COSCOM
	Cape Horn	RO/RO	RRF	27 Oct 90	23 Nov 90	Ad Damman	5,062	1st COSCOM
	Cape Carthage	BB	RRF	21 Dec 90	15 Jan 91	Ad Damman	6,956	Assisted Combat Svc Spt
	Key Splendor	BB	FOR (NC)	21 Dec 90	22 Jan 91	Ad Damman	1,598	Assisted Combat Svc Spt
	Saudi Diriyah	RO/RO	FOR	21 Dec 90	11 Jan 91	Ad Damman	7,897	Assisted Combat Svc Spt
	Pheasant	BB	FOR	29 Dec 90	31 Jan 91	Ad Damman	1,375	Assisted Combat Svc Spt
	Clipper Majic	BB	FOR	3 Jan 91	31 Jan 91	Ad Damman	2,242	Assisted Combat Svc Spt
	Fisher	RO/RO	US (MPS)	21 Jan 91	17 Feb 91	Ad Damman	5,783	Assisted Combat Svc Spt
	Cape Douglas	RO/RO	RRF	25 Jan 91	18 Feb 91	Ad Damman	7,914	Assisted Combat Svc Spt
	Bellatrix	RO/RO	FSS	4 Feb 91	20 Feb 91	Ad Damman	11,213	Tanks/HEMTTs
	Cape Inscription	RO/RO	RRF	8 Feb 91	26 Feb 91	Ad Damman	6,275	FO/Assisted Combat Svc Spt
	Cape Lobos	RO/RO	RRF	5 Feb 91	8 Mar 91	Ad Damman	2,758	HEMMTs 10T
	Jolly Rubino	RO/RO	FOR	6 Feb 91	2 Mar 91	Ad Damman	4,946	FO/Assisted Combat Svc Spt

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
BAYONNE, NJ	*Saudi Makkah*	RO/RO	FOR	10 Feb 91	7 Mar 91	Ad Damman	5,799	FO/Assisted Combat Svc Spt
(Con't)	*Cape Lambert*	RO/RO	RRF	15 Feb 91	14 Mar 91	Ad Damman	2,743	17 MI, 134 CS Resupply
	Tarkwa	RO/RO	FOR	16 Feb 91	(U-TURN)		2,313	FO/Assisted Combat Svc Spt
	Cape Decision	RO/RO	RRF	17 Feb 91	13 Mar 91	Ad Damman	8,178	FO/Assisted Combat Svc Spt
BEAUMONT, TX	*Gulf Banker*[2]	BB	RRF	29 Aug 90	DIW	Ad Damman	Unknown	3d ACR
	Ashley Lykes	BB	US	2 Sep 90	25 Sep 90	Al Jubayl	2,772	3d ACR
	Cape Horn	RO/RO	RRF	5 Sep 90	1 Oct 90	Ad Damman	13,115	3d ACR
	Gulf Trader	BB	RRF	6 Sep 90	2 Oct 90	Ad Damman	2,069	3d ACR
	Cape Ducato	RO/RO	RRF	7 Sep 90	2 Oct 90	Ad Damman	10,461	3d ACR
	Honduras	BB	FOR	9 Sep 90	5 Oct 90	Ad Damman	2,178	3d ACR
	Meteor	RO/RO	RRF	10 Sep 90	5 Oct 90	Ad Damman	2,943	1st COSCOM
	Mostween 7	BB	FOR	15 Sep 90	12 Oct 90	Ad Damman	2,854	1st BDE, 2d AD
	Zoella Lykes	BB	US	17 Sep 90	12 Oct 90	Ad Damman	3,494	1st BDE, 2d AD
	Comet	RO/RO	RRF	18 Sep 90	14 Oct 90	Ad Damman	3,880	1st BDE, 2d AD
	Merchant Premier	BB	FOR	19 Sep 90	17 Oct 90	Ad Damman	3,364	1st BDE, 2d AD
	Saudi Riyadh	RO/RO	FOR	20 Sep 90	19 Oct 90	Ad Damman	5,613	1st BDE, 2d AD
	Regulus	RO/RO	FSS	23 Sep 90	9 Oct 90	Ad Damman	13,181	1st BDE, 2d AD
	Algol	RO/RO	FSS	7 Oct 90	24 Oct 90	Ad Damman	9,623	11th AD ARTY BDE
	Gulf Banker	BB	RRF	9 Dec 90	5 Jan 91	Ad Damman	1,037	216 Medical Co
	John Lykes	BB	US	13 Dec 90	9 Jan 91	Ad Damman	2,442	1011th CS, 84th CS
	Cape Catawba	BB	RRF	24 Dec 90	25 Jan 91	Ad Damman	1,877	Assisted Combat Svc Spt
	Del Monte[3]	BB	RRF	1 Jan 91		Ad Damman	6,198	224th CS Co
CHARLESTON, SC	*Mercandian Senator*	RO/RO	FOR	15 Sep 90	19 Oct 90	Ad Damman	1,526	1st COSCOM
	Mercandian Duke	RO/RO	FOR	18 Sep 90	19 Oct 90	Ad Damman	1,412	1st COSCOM
	Cape Nome	BB	RRF	20 Sep 90	15 Oct 90	Ad Damman	3,056	1st COSCOM
	Hauge	RO/RO	US (MPS)	26 Sep 90	21 Oct 90	Ad Damman	14,382	1st COSCOM
	Adrian Maersk	RO/RO	FOR	2 Oct 90	28 Oct 90	Ad Damman	1,479	1st COSCOM
	Baugh	RO/RO	US (MPS)	7 Oct 90	3 Nov 90	Ad Damman	3,995	1st COSCOM
	Albert Maersk	RO/RO	FOR	16 Oct 90	12 Nov 90	Ad Damman	1,453	1st COSCOM
	Cape Isabel	RO/RO	RRF	23 Oct 90	10 Nov 90	Ad Damman	4,095	1st COSCOM
	Cape Horn	RO/RO	RRF	3 Nov 90	24 Nov 90	Ad Damman	2,700	1st COSCOM
	Diamond State	TACS	RRF	22 Dec 90	11 Jan 91	Ad Damman	2,382	Assisted Combat Svc Spt

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
CHARLESTON, SC (Con't)	*American Condor*	RO/RO	US	25 Dec 90	16 Jan 91	Ad Damman	1,363	Assisted Combat Svc Spt
	Cape Canso	BB	RRF	28 Dec 90	26 Jan 91	Ad Damman	1,146	Assisted Combat Svc Spt
	Green Valley	BB	US	2 Jan 91	23 Jan 91	Ad Damman	1,411	Assisted Combat Svc Spt
	Cape Domingo	RO/RO	RRF	11 Jan 91	6 Feb 91	Ad Damman	6,557	Assisted Combat Svc Spt
CHEATHAM ANNEX, VA (NEAR NEWPORT NEWS)	*Ciudad De Manta*	BB	FOR	31 Dec 90	1 Feb 91	Al Jubayl	4,899	II MEF
	Ambassador	BB	RRF	21 Feb 91	(U-TURN)		2,890	USMC Matting
CONCORD, CA	*Cape Breton*	BB	RRF	14 Sep 90	14 Oct 90	Ad Damman	9,280	Ammo
	Anna L	BB	FOR	10 Oct 90	14 Nov 90	Bahrain	4,406	MEF/Ammo
	Austral Lightning	LASH	RRF	20 Dec 90	15 Jan 91	Ad Damman	6,388	USAF Ammo
	Hanjin Jedda	BB	FOR (NC)	1 Jan 91	5 Feb 91	Al Jubayl	8,079	USMC Ammo
	Neptune Peridot	BB	FOR	25 Jan 91	(U-TURN)		5,095	USMC Ammo
	Merchant Premier	BB	FOR	8 Feb 91	(U-TURN)		9,663	USMC Ammo
	Letitia Lykes	BB	US	20 Feb 91	(U-TURN)		8,701	USAF Ammo
	Sletter	BB	FOR	24 Feb 91	(U-TURN)		8,566	USMC Ammo
	Flag Mars	BB	FOR	26 Feb 91	(U-TURN)		8,183	USAF Ammo
EARLE, NJ	*Crystal Star*	BB	FOR	28 Jan 91	21 Feb 91	Ad Damman	5,007	USN/USMC Ammo
	Pride	BB	RRF	10 Feb 91	(U-TURN)		6,694	USMC Ammo
GUAM	*Maersk Constellation*	RO/RO	US*	2 Sep 90	18 Sep 90	Al Jubayl	6,698	Navy Construction Mobile BN
	Cape Gibson	BB	RRF	30 Jan 91	14 Feb 91	Jeddah	7,985	USAF Ammo
	Cape Borda	BB	RRF	19 Feb 91	1 Mar 91	Diego Garcia	7,481	USAF Ammo
	Cape Juby	BB	RRF	23 Feb 91	(U-TURN)		4,774	USMC Ammo
GULFPORT, MI	*Mercury*	RO/RO	US	25 Jan 91	19 Feb 91	Al Jubayl	3,398	Navy Const. Mobile BN
HOUSTON, TX	*La Paix*	BB	FOR	29 Aug 90	25 Sep 90	Ad Damman	1,943	III Corps ARTY
	Cape Clear	BB	RRF	1 Sep 90	27 Sep 90	Ad Damman	1,943	III Corps ARTY
	Jupiter	RO/RO	RRF	5 Sep 90	28 Sep 90	Ad Damman	2,916	13th COSCOM
	Takoradi	RO/RO	FOR	6 Sep 90	1 Oct 90	Ad Damman	2,990	212d FA ARTY BDE
	Washington[2]	Seatrain	RRF	7 Sep 90			Unknown	75th FA ARTY BDE
	Cape Mendocino[1]	SeaBee	RRF	8 Sep 90	DIW	Ad Damman	2,809	212d FA ARTY BDE
	Cape Edmont	RO/RO	RRF	9 Sep 90	10 Oct 90	Ad Damman	5,173	57th Signal BDE
	Mercury	RO/RO	US	14 Sep 90	4 Oct 90	Ad Damman	3,604	57th Signal BDE

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
HOUSTON, TX	*Maine*	BB	RRF	15 Sep 90	18 Oct 90	Ad Damman	2,438	1st CAV DIV
(Con't)	*Capella*	RO/RO	FSS	18 Sep 90	6 Oct 90	Ad Damman	9,304	1st CAV DIV
	Saudi Abha	RO/RO	FOR	19 Sep 90	14 Oct 90	Ad Damman	7,220	1st CAV DIV
	Pollux	RO/RO	FSS	24 Sep 90	12 Oct 90	Ad Damman	13,567	1st CAV DIV
	Bellatrix	RO/RO	FSS	25 Sep 90	13 Oct 90	Ad Damman	11,479	1st CAV DIV
	Saudi Makkah	RO/RO	FOR	28 Sep 90	22 Oct 90	Ad Damman	6,017	1st CAV DIV
	Denebola	RO/RO	FSS	30 Sep 90	17 Oct 90	Ad Damman	10,357	1st CAV DIV
	Fisher	RO/RO	US (MPS)	3 Oct 90	1 Nov 90	Ad Damman	11,872	13th COSCOM
	Cape Inscription	RO/RO	RRF	5 Oct 90	27 Oct 90	Ad Damman	4,358	13th COSCOM
	Cape Hudson	RO/RO	RRF	9 Oct 90	3 Nov 90	Ad Damman	7,127	13th COSCOM
	Altair	RO/RO	FSS	16 Oct 90	3 Nov 90	Ad Damman	9,140	13th COSCOM
	Bellatrix	RO/RO	FSS	10 Nov 90	27 Nov 90	Ad Damman	6,008	13th COSCOM
	Stena Searider	RO/RO	FOR	21 Nov 90	22 Dec 90	Ad Damman	2,910	588th Eng. BN
	Merzario Italia	RO/RO	FOR	5 Dec 90	4 Jan 91	Ad Damman	2,855	2-158 AVN BN
	Altair	RO/RO	FSS	6 Dec 90	22 Dec 90	Ad Damman	6,056	701st CS BN
	Adrian Maersk	RO/RO	FOR	7 Dec 90	7 Jan 91	Ad Damman	1,425	1st ID
	Denebola	RO/RO	FSS	7 Dec 90	25 Dec 90	Ad Damman	8,183	1st ID
	Jolly Rubino	RO/RO	FOR	7 Dec 90	7 Jan 91	Ad Damman	8,464	1st ID
	American Eagle	RO/RO	US	8 Dec 90	7 Jan 91	Ad Damman	8,402	1st ID
	Gallent II	BB	FOR	11 Dec 90	11 Jan 91	Ad Damman	3,405	1st ID
	Strong American	RO/RO	US	13 Dec 90	18 Jan 91	Ad Damman	2,889	1st ID
	Tarkwa	RO/RO	FOR	16 Dec 90	15 Jan 91	Ad Damman	1,800	1st ID
	Cape Decision	RO/RO	RRF	17 Dec 90	12 Jan 91	Ad Damman	6,499	1st ID
	Skodsborg	RO/RO	FOR	17 Dec 90	15 Jan 91	Ad Damman	4,023	1st ID
	Wladyslawowo	BB	FOR	20 Dec 90	17 Jan 91	Ad Damman	1,416	1st ID
	Albert Maersk	RO/RO	FOR	21 Dec 90	21 Jan 91	Ad Damman	1,764	1st ID
	Algol	RO/RO	FSS	28 Dec 90	15 Jan 91	Ad Damman	12,660	1st ID
	Cape Diamond	RO/RO	RRF	28 Dec 90	26 Jan 91	Ad Damman	5,780	1st ID
	Leslie Lykes	BB	US	13 Jan 91	13 Feb 91	Ad Damman	3,224	Assisted Combat Svc Spt
	Meteor	RO/RO	RRF	18 Jan 91	16 Feb 91	Ad Damman	3,972	Assisted Combat Svc Spt
	Naxos Pride	BB	FOR	19 Jan 91	21 Feb 91	Ad Damman	34	Assisted Combat Svc Spt
	Cape Henry	RO/RO	RRF	20 Jan 91	18 Feb 91	Ad Damman	7,622	Assisted Combat Svc Spt
JACKSONVILLE, FL	*American Eagle*	RO/RO	US	19 Aug 90	9 Sep 90	Ad Damman	2,864	101st ABN DIV
	Cape Lobos	RO/RO	RRF	21 Aug 90	16 Sep 90	Ad Damman	6,339	101st ABN DIV
	Cape Douglas	RO/RO	RRF	25 Aug 90	17 Sep 90	Ad Damman	15,297	101st ABN DIV
	Lyra	RO/RO	US	25 Aug 90	17 Sep 90	Ad Damman	9,177	101st ABN DIV

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
JACKSONVILLE, FL	*Callaghan*	RO/RO	RRF	29 Aug 90	17 Sep 90	Ad Damman	3,734	101st ABN DIV
(Con't)	*Cape Mohican*	SeaBee	RRF	1 Sep 90	24 Sep 90	Ad Damman	4,017	101st ABN DIV
	Cape Alexander	BB	RRF	4 Sep 90	1 Oct 90	Ad Damman	781	101st ABN DIV
	Cape Juby	BB	RRF	4 Sep 90	25 Sep 90	Ad Damman	1,108	101st ABN DIV
	Cape Catoche	BB	RRF	7 Sep 90	30 Sep 90	Ad Damman	1,225	101st ABN DIV
	Saudi Hail	RO/RO	FOR	10 Sep 90	6 Oct 90	Ad Damman	4,107	101st ABN DIV
	Avlis	BB	FOR	16 Sep 90	14 Oct 90	Ad Damman	1,132	1st COSCOM
	Arita	BB	FOR	17 Sep 90	15 Oct 90	Ad Damman	1,615	1st COSCOM
	American Condor[2]	RO/RO	US	22 Sep 90	14 Oct 90	Ad Damman	3,915	3d ACR/75th FA BDE
	Paci	BB	FOR	22 Sep 90	22 Oct 90	Ad Damman	3,500	1st COSCOM
	Bonnyman	RO/RO	US (MPS)	28 Sep 90	23 Oct 90	Ad Damman	6,426	1st COSCOM
	Del Valle	BB	RRF	28 Sep 90	21 Oct 90	Ad Damman	2,960	1st COSCOM
	Merizario Italia	RO/RO	FOR	29 Sep 90	26 Oct 90	Ad Damman	4,108	1st COSCOM
	Washington[4]	Seatrain	RRF	2 Oct 90			2,760	1st COSCOM
	Cape Henry	RO/RO	RRF	5 Oct 90	29 Oct 90	Ad Damman	6,829	1st COSCOM
	American Eagle	RO/RO	US	6 Oct 90	27 Oct 90	Ad Damman	1,548	1st COSCOM, 7th Grp
	St. Roland	RO/RO	FOR	8 Oct 90	31 Oct 90	Ad Damman	565	1st COSCOM
	Cape Johnson	BB	RRF	9 Oct 90	31 Oct 90	Ad Damman	1,257	1st COSCOM
	Cape Lambert	RO/RO	RRF	13 Oct 90	13 Nov 90	Ad Damman	2,063	1st COSCOM
	Lyra	RO/RO	US	15 Oct 90	10 Nov 90	Ad Damman	3,705	1st COSCOM
	Merzario Britannia	RO/RO	FOR	15 Oct 90	11 Nov 90	Ad Damman	4,674	1st COSCOM
	Lopez	RO/RO	US (MPS)	23 Oct 90	26 Nov 90	Ad Damman	3,429	1st COSCOM
	Regulus	RO/RO	FSS	2 Nov 90	16 Nov 90	Ad Damman	6,895	1st COSCOM
	Arcade Eagle	RO/RO	FOR	7 Nov 90	5 Dec 90	Ad Damman	1,243	1st COSCOM
	Saudi Abha	RO/RO	FOR	8 Nov 90	4 Dec 90	Ad Damman	7,857	1st COSCOM
	Cape Alexander	BB	RRF	13 Nov 90	4 Dec 90	Ad Damman	1,494	1st COSCOM
	Saudi Hofuf	RO/RO	FOR	23 Nov 90	19 Dec 90	Ad Damman	2,047	1st COSCOM
	Comet	RO/RO	RRF	27 Nov 90	21 Dec 90	Ad Damman	2,556	1st COSCOM
	Green Lake	BB (VC)	US (NC)	3 Dec 90	26 Dec 90	Ad Damman	2,216	43d Engineering BN
	Jurina	BB	FOR	8 Dec 90	13 Jan 91	Ad Damman	1,457	Assisted Combat Svc Spt
	Atalanta T	BB	FOR	9 Dec 90	10 Jan 91	Ad Damman	1,632	2/52 AD ARTY
	Galveston Bay	BB	US	10 Dec 90	31 Dec 90	Ad Damman	2,971	II MEF
	Jupiter	RO/RO	RRF	16 Dec 90	4 Jan 91	Ad Damman	3,270	Assisted Combat Svc Spt
	Senator	RO/RO	US	16 Dec 90	12 Jan 91	Ad Damman	2,368	Assisted Combat Svc Spt
	Mallory Lykes	BB	US	20 Dec 90	12 Jan 91	Ad Damman	7,552	II MEF Cntrs
	Aurora T	BB	FOR	22 Dec 90	29 Jan 91	Ad Damman	1,350	Assisted Combat Svc Spt
	Cape Cod	BB	RRF	27 Dec 90	20 Jan 91	Ad Damman	1,275	Assisted Combat Svc Spt

APPENDIX 10 (Con't)

PORT	SHIP SHIP	SHIPPING TYPE	SPOE SOURCE	SPOD DEPARTURE	SPOD ARRIVAL	LOCATION	STONS	LOAD
JACKSONVILLE, FL	*Stena Trailer*	RO/RO	FOR	27 Dec 90	24 Jan 91	Ad Damman	2,999	II MEF
(Con't)	*Ponce*[3]	RO/RO	US	1 Jan 91	22 Jan 91	Ad Damman	6,198	224th CS Co
	Ciudad de Manta	BB	FOR	6 Jan 91	31 Jan 91	Ad Damman	846	II MEF
	Kavo Peiratis	BB	FOR	8 Jan 91	8 Feb 91	Ad Damman	1,860	Assisted Combat Svc Spt
	Pollux	RO/RO	FSS	11 Jan 91	28 Jan 91	Ad Damman	6,818	Assisted Combat Svc Spt
	Arcade Falcon	RO/RO	FOR	21 Jan 91	19 Feb 91	Ad Damman	1,182	Assisted Combat Svc Spt/II MEF
	Hauge	RO/RO	US (MPS)	23 Jan 91	16 Feb 91	Ad Damman	6,737	Assisted Combat Svc Spt
	Capella	RO/RO	FSS	24 Jan 91	13 Feb 91	Ad Damman	7,419	Assisted Combat Svc Spt
	Naxos Pride	BB	FOR	25 Jan 91	21 Feb 91	Ad Damman	1,712	Assisted Combat Svc Spt
	ASL Cygnus	RO/RO	FOR	27 Jan 91	23 Feb 91	Ad Damman	3,896	Assisted Combat Svc Spt
	Mercury	RO/RO	US	29 Jan 91	19 Feb 91	Al Jubayl	8,024	USMC Unit Equipment
	Jupiter[8]	RO/RO	RRF	31 Jan 91			5,040	Assisted Combat Svc Spt
	Lash Atlantico	LASH	US	31 Jan 91	21 Feb 91	Al Jubayl	4,492	II MEF
	Comet	RO/RO	RRF	7 Feb 91	(U-TURN)		2,205	Assisted Combat Svc Spt
	Banner	BB	RRF	9 Feb 91	(U-TURN)		1,472	Assisted Combat Svc Spt
	Cape Horn	RO/RO	RRF	16 Feb 91	13 Mar 91	Ad Damman	9,604	Assisted CS/Combat Svc Spt
	Saudi Riyadh	RO/RO	FOR	27 Feb 91	(U-TURN)		4,831	Follow-On Equipment
	Ambassador	BB	RRF	8 Mar 91	(U-TURN)		0	Follow-On Equipment
LONG BEACH, CA	*Cape Borda*	BB	RRF	10 Sep 90	25 Oct 90	Al Jubayl	1,656	I MEF
	Alpha Challenge	RO/RO	FOR	18 Sep 90	24 Oct 90	Al Jubayl	2,784	I MEF
	Samsun Honor	BB	FOR (NC)	18 Sep 90	25 Oct 90	Al Jubayl	1,240	I MEF
	Bright Skies	BB	FOR	26 Sep 90	5 Nov 90	Al Jubayl	1,039	I MEF
	McCoral	BB	FOR	6 Oct 90	11 Nov 90	Al Jubayl	1,073	I MEF
	Encouragement	BB	FOR	10 Oct 90	8 Nov 90	Ad Damman	1,495	1st COSCOM
	Austral Rainbow	LASH	US (PREPOS)	31 Oct 90	27 Nov 90	Raysut	2,791	4449 MSS
	Danah	BB	FOR (NC)	15 Nov 90	19 Dec 90	Ad Damman	2,546	4449 MSS
	Green Ridge	BB	US	21 Nov 90	29 Dec 90	Al Jubayl	1,444	3d MAW/1st FSSG
	Indian Express	BB	FOR	16 Dec 90	19 Jan 91	Ad Damman	1,470	222/2222 Trans Corps Co
	Neptune Sardonyx	BB	FOR	16 Dec 90	19 Jan 91	Ad Damman	1,439	II MEF/5th MEB
	Cumbrian Express	BB	FOR	21 Dec 90	24 Jan 91	Ad Damman	1,621	257th Trans Corps/235th CS
	Heidi Leonhardt	BB	FOR	23 Dec 90	1 Feb 91	Ad Damman	1,901	II MEF/5th MEB
	Trident Baltic	BB	FOR	28 Dec 90	6 Feb 91	Ad Damman	2,511	222/2222 Trans Corps Co
	Uniselva	BB	FOR	28 Dec 90	3 Feb 91	Al Jubayl	1,903	II MEF/5th MEB
	McJade	BB	FOR	5 Jan 91	12 Feb 91	Ad Damman	3,769	1404th Trans Corps/264 CS
	Denebola	RO/RO	FSS	8 Feb 91	(U-TURN)		8,856	I MEF Reserve

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
LUALUALEI, HI	*Cape Juby*	BB	RRF	11 Feb 91	(U-TURN)		4,852	USMC/Navy Ammo
MOREHEAD CITY, NC	*Wright*	LO/LO	T-AVB	26 Aug 90	17 Sep 90	Unknown	2,800	USMC
	Cape Borda	BB	RRF	6 Dec 90	26 Dec 90	Al Jubayl	2,031	II MEF
	Cape Clear	BB	RRF	9 Dec 90	30 Dec 90	Al Jubayl	1,337	II MEF
	Encouragement	BB	FOR	12 Dec 90	7 Jan 91	Al Jubayl	2,190	II MEF
	Prince Shaul	BB	FOR	16 Dec 90	17 Jan 91	Al Jubayl	1,667	II MEF
	Stena Trader	RO/RO	FOR	14 Dec 90	8 Jan 91	Al Jubayl	1,969	II MEF
	Anthos	BB	FOR	16 Dec 90	17 Jan 91	Al Jubayl	1,060	II MEF
NEWPORT NEWS, VA	*Anderson*	RO/RO	US (MPS)	23 Sep 90	26 Oct 90	Ad Damman	5,537	85th Evacuation
	American Eagle	RO/RO	US	2 Oct 90	28 Oct 90	Ad Damman	2,610	1st COSCOM/7th Grp
	Pollux	RO/RO	FSS	2 Nov 90	20 Nov 90	Ad Damman	4,332	1st COSCOM/7th Grp
	Samsun Honor	BB	FOR (NC)	8 Dec 90	10 Jan 91	Ad Damman	2,066	1229th Trans Corps
	Letitia Lykes	BB	US	13 Dec 90	4 Jan 91	Ad Damman	2,515	Assisted Combat Svc Spt
	Cosman I	BB	FOR	14 Dec 90	9 Jan 91	Ad Damman	3,077	Assisted Combat Svc Spt
	Ghikas	BB	FOR	17 Dec 90	14 Jan 91	Ad Damman	2,949	Assisted Combat Svc Spt
	McCoral	BB	FOR	19 Dec 90	2 Feb 91	Ad Damman	2,625	Assisted Combat Svc Spt
	Mariner	BB	FOR	20 Dec 90	20 Jan 91	Ad Damman	989	Assisted Combat Svc Spt
	Expedient	BB	FOR	23 Dec 90	20 Jan 91	Ad Damman	1,128	Assisted Combat Svc Spt
	Green Valley	BB	US	31 Dec 90	23 Jan 91	Ad Damman	28,415	Assisted Combat Svc Spt
NORFOLK, VA	*American Comorant*	FLO/FLO	US (PREPOS)	27 Jan 91	23 Feb 91	Ad Damman	5,700	Landing Craft Utility/Lash Barges
OAKLAND MILITARY	*Gallant II*	BB	FOR	20 Sep 90	23 Oct 90	Ad Damman	1,390	1st COSCOM
OCEAN TERMINAL	*Regal Crusader*	BB	FOR	20 Sep 90	26 Oct 90	Ad Damman	3,160	11th Signal BDE
BAY AREA, CA	*Arnold Maersk*	RO/RO	FOR	28 Sep 90	30 Oct 90	Ad Damman	1,056	1st COSCOM
	Austral Lightning	LASH	RRF	8 Oct 90	2 Nov 90	Ad Damman	4,510	1st COSCOM
	Cape Gibson	BB	RRF	9 Oct 90	1 Nov 90	Ad Damman	2,583	52d Eng. BN
	Encouragement	BB	FOR	10 Oct 90	8 Nov 90	Ad Damman	145	1st COSCOM
	Maersk Constellation	RO/RO	US*	9 Nov 90	7 Dec 90	Ad Damman	6,322	Bradleys
	Jolly Smeraldo	RO/RO	FOR	18 Nov 90	5 Dec 90	Bahrain	2,183	1st COSCOM
	Cape Breton	BB	RRF	26 Nov 90	26 Dec 90	Ad Damman	2,564	864 Eng. BN
	Gopher State	TACS	RRF	4 Dec 90	31 Dec 90	Ad Damman	2,571	Bradley Force Modernization Eqp
	Italian Express	BB	FOR	6 Dec 90	21 Jan 91	Ad Damman	1,336	Medical & Trans Corps Units
	Unipuna	BB	FOR	10 Dec 90	10 Jan 91	Ad Damman	1,346	740th Trans Corps/928th CS
	California	BB	RRF	16 Dec 90	27 Jan 91	Ad Damman	1,323	1742d Trans Corps

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
OAKLAND MILITARY	*Austral Lightning*	LASH	RRF	20 Dec 90	16 Jan 91	Ad Damman	2,239	Helicopters & Medical
OCEAN TERMINAL	*Cape Blanco*	BB	RRF	22 Dec 90	22 Jan 91	Ad Damman	850	CS/Combat Svc Spt
BAY AREA, CA (Con't)	*Cape Bover*	BB	RRF	22 Dec 90	21 Jan 91	Ad Damman	2,482	CS/Combat Svc Spt
	Northern Light	BB	RRF	22 Dec 90	27 Jan 91	Ad Damman	1,025	CS/Combat Svc Spt
	Cape Bon	BB	RRF	22 Dec 90	28 Jan 91	Ad Damman	1,872	250th Trans Corps Co
	Tamamina	BB	FOR	14 Feb 91	(U-TURN)		3,423	356th Signal Corps BN/M2/3s
PORT HUENEME, CA	*Green Ridge*	BB	US	6 Sep 90	7 Oct 90	Ad Damman	3,827	Navy Construction Mobile BN 5
	Alpha Challenge	RO/RO	FOR	18 Sep 90	24 Oct 90	Al Jubayl	1,269	11th Signal BDE
	Mosstar	BB	FOR	23 Sep 90	27 Oct 90	Al Jubayl	1,951	11th Signal BDE
	Slagen	BB	FOR	25 Sep 90	30 Oct 90	Ad Damman	1,198	11th Signal BDE
	Bright Skies	BB	FOR	25 Sep 90	6 Nov 90	Ad Damman	898	11th Signal BDE
	McCoral	BB	FOR	6 Oct 90	12 Nov 90	Ad Damman	1,025	11th Signal BDE
	Hirado Maru	BB	FOR (NC)	21 Oct 90	28 Nov 90	Al Jubayl	5,570	4449th MSS
	Flickertail State[5]	TACS	RRF	17 Dec 90	15 Jan 91	Ad Damman	2,043	5th MEB
	Cape Girardeau[5]	BB	RRF	23 Dec 90	19 Jan 91	Ad Damman	4,200	5th MEB Withhold
	Neptune Iolite[5]	BB	FOR	12 Jan 91	19 Feb 91	Ad Damman	3,021	5th MEB
	Mostween 6	BB	FOR	18 Feb 91	(U-TURN)		5,465	US N/USMC FO Eqp
	Hugo Oldendorf	BB	FOR	21 Feb 91	(U-TURN)		1,274	Force Modernization/FO Eqp
ROOSEVELT ROADS, PR	*Kubbar*	BB	FOR (NC)	21 Sep 90	15 Oct 90	Al Jubayl	1,880	Navy Construction Mobile BN 4
SAVANNAH, GA								
	Capella	RO/RO	FSS	13 Aug 90	27 Aug 90	Ad Damman	15,477	24th ID
	Altair	RO/RO	FSS	14 Aug 90	28 Aug 90	Ad Damman	12,763	24th ID
	Bellatrix	RO/RO	FSS	15 Aug 90	1 Sep 90	Ad Damman	6,634	24th ID
	Regulus	RO/RO	FSS	16 Aug 90	31 Aug 90	Ad Damman	10,856	24th ID
	Algol	RO/RO	FSS	18 Aug 90	5 Sep 90	Ad Damman	13,782	24th ID
	Cape Inscription	RO/RO	RRF	20 Aug 90	8 Sep 90	Ad Damman	4,109	197th Infantry BDE
	Cape Hudson	RO/RO	RRF	21 Aug 90	12 Sep 90	Ad Damman	11,352	197th Infantry BDE
	Denebola	RO/RO	FSS	22 Aug 90	7 Sep 90	Ad Damman	14,253	197th Infantry BDE
	Cygnus	RO/RO	FOR	25 Aug 90	19 Sep 90	Ad Damman	7,363	24th ID
	Antares[6]	RO/RO	FSS	14 Sep 90	DIW	Ad Damman	7,280	24th ID
	Anna L	BB	FOR	23 Dec 90	18 Jan 91	Ad Damman	2,117	Assisted Combat Svc Spt
	American Condor	RO/RO	US	24 Dec 90	17 Jan 91	Ad Damman	9,001	Assisted Combat Svc Spt

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
SOUTH ATLANTIC	*American Falcon*	RO/RO	US	1 Sep 90	27 Sep 90	Ad Damman	2,740	XVIII ABN Corps
OUTPORT, SC	*Cape Catoche*	BB	RRF	4 Sep 90	30 Sep 90	Ad Damman	794	XVIII ABN Corps
(CHARLESTON)								
SUNNY POINT	*Cape Domingo*	RO/RO	RRF	23 Aug 90	17 Sep 90	Ad Damman	17,116	4th MEB
MILITARY OCEAN	*Strong Texan*	RO/RO	US	29 Aug 90	1 Oct 90	Ad Damman	1,603	4th MEB
TERMINAL, NC	*Cleveland*	BB	US	31 Aug 90	21 Sep 90	Ad Damman	11,533	Ammo
	Oslo (Bassro) Polar	RO/RO	FOR	8 Sep 90	6 Oct 90	Ad Damman	3,890	4th MEB
	Cape Archway	BB	RRF	11 Sep 90	9 Oct 90	Ad Damman	9,584	Ammo
	Aurora T	BB	FOR	17 Sep 90	19 Oct 90	Ad Damman	3,986	4th MEB
	Rover	RO/RO	US	19 Sep 90	11 Oct 90	Ad Damman	6,187	Ammo
	Pheasant	BB	FOR	20 Sep 90	22 Oct 90	Ad Damman	1,928	4th MEB
	Green Harbour	LASH	US (PREPOS)	8 Oct 90	3 Nov 90	Ad Damman	14,777	Ammo
	Tampa Bay	BB	US	9 Nov 90	30 Nov 90	Ad Damman	7,226	Ammo
	Green Island	LASH	US (PREPOS)	8 Dec 90	6 Jan 91	Ad Damman	24,689	Ammo
	Cape Florida	LASH	RRF	8 Dec 90	14 Jan 91	Ad Damman	25,815	Ammo
	Cape Flattery	LASH	RRF	18 Dec 90	16 Jan 91	Ad Damman	25,386	Ammo
	Winter Sea	REEFER	FOR	28 Dec 90	18 Jan 91	Ad Damman	8,912	Ammo
	American Kestral	LASH	US (PREPOS)	1 Jan 91	4 Feb 91	Ad Damman	18,536	Ammo
	Winter Water	REEFER	FOR	6 Jan 91	26 Jan 91	Ad Damman	8,912	Ammo
	Belle	BB	FOR	15 Jan 91	(U-TURN)		8,678	Ammo
	Anangel Leader	BB	FOR	23 Jan 91	(U-TURN)		19,490	Ammo
	Dock Express II	BB	FOR	23 Jan 91	21 Feb 91	Ad Damman	3,835	Ammo
	Almas	BB	FOR	24 Jan 91	(U-TURN)		7,592	Ammo
	Courier	BB	RRF	25 Jan 91	(U-TURN)		9,187	USMC Ammo
	Zoella Lykes	BB	US	26 Jan 91	(U-TURN)		9,493	USMC Ammo
	Mar Courrier	BB	FOR	31 Jan 91	(U-TURN)		8,972	Ammo
	Aetos	BB	FOR	1 Feb 91	(U-TURN)		8,175	Ammo
	Amitie	BB	FOR	1 Feb 91	(U-TURN)		10,132	Ammo
	Cape Nome	BB	RRF	5 Feb 91	(U-TURN)		5,657	Ammo
	Kubbar	BB	FOR (NC)	8 Feb 91	(U-TURN)		12,568	Ammo
	Lake	BB	RRF	8 Feb 91	(U-TURN)		8,150	Ammo
	Noble Star	BB	US (PREPOS)	9 Feb 91	(U-TURN)		7,005	Containerized Ammo
	Gulf Banker	BB	RRF	10 Feb 91	(U-TURN)		7,388	Ammo
	Nancy Lykes	BB	US	12 Feb 91	(U-TURN)		6,986	Ammo
	Ruth Lykes	BB	US	17 Feb 91	(U-TURN)		8,814	Ammo
	Buyer	BB	RRF	18 Feb 91	(U-TURN)		8,647	Ammo

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
SUNNY POINT	*Mosstar*	BB	FOR	18 Feb 91	(U-TURN)		8,531	Ammo
MILITARY OCEAN	*Cape Johnson*	BB	RRF	22 Feb 91	(U-TURN)		9,374	Ammo
TERMINAL, NC (Con't)	*Cape Blanco*	BB	RRF	28 Feb 91	(U-TURN)		9,112	Ammo
	Anna L	BB	FOR	9 Mar 91	(U-TURN)		Unknown	Ammo
	Santa Ana	BB	RRF	9 Mar 91	(U-TURN)		8,026	Ammo
TACOMA, WA	*Green Lake*	BB (VC)	US (NC)	19 Sep 90	15 Oct 90	Ad Damman	3,460	9th ID
	Ar Rabbu	BB	FOR	26 Sep 90	30 Oct 90	Ad Damman	1,903	543d CS Main
	Trident Endeavor	BB	FOR	7 Dec 90	6 Jan 91	Ad Damman	2,841	864 Eng. BN
	Trident Dusk[11]	Multi-Purpose	FOR	17 Dec 90	7 Feb 91	Ad Damman	2,371	CS/Combat Svc Spt
	Cape Blanco	BB	RRF	22 Dec 90	24 Jan 91	Ad Damman	1,309	CS/Combat Svc Spt
WILMINGTON, NC	*Pollux*	RO/RO	FSS	16 Aug 90	31 Aug 90	Ad Damman	10,279	XVIII ABN Corps
	Cape Henry	RO/RO	RRF	20 Aug 90	9 Sep 90	Ad Damman	12,930	1st COSCOM
	Cape May	SeaBee	RRF	30 Aug 90	24 Sep 90	Ad Damman	7,256	XVIII ABN Corps
	Tampa Bay	BB	US	31 Aug 90	20 Sep 90	Ad Damman	10,609	XVIII ABN Corps
	Cape Decision	RO/RO	RRF	1 Sep 90	24 Sep 90	Ad Damman	15,885	XVIII ABN Corps
	American Falcon	RO/RO	US	3 Sep 90	27 Sep 90	Ad Damman	8,613	197th Spt Sqdn
	Cape Isabel	RO/RO	RRF	7 Sep 90	28 Sep 90	Ad Damman	7,492	1st COSCOM
	Neos	BB	FOR	9 Sep 90	13 Oct 90	Ad Damman	878	XVIII ABN Corps
	Cape Farewell	LASH	RRF	10 Sep 90	5 Oct 90	Ad Damman	7,903	1st COSCOM
	Cape Flattery	LASH	RRF	11 Sep 90	4 Oct 90	Ad Damman	10,844	1st COSCOM
	Noble Star	BB	US (PREPOS)	7 Dec 90	1 Jan 91	Al Jubayl	4,708	II MEF
	Ro Ro Sprinter	RO/RO	FOR	7 Dec 90	9 Jan 91	Ad Damman	1,430	II MEF
	Marine Reliance	RO/RO	US	11 Dec 90	5 Jan 91	Al Jubayl	3,301	II MEF
	Trident Arc	BB	FOR	12 Dec 90	7 Jan 91	Al Jubayl	1,622	II MEF
	Efdim Junior	BB	FOR	13 Dec 90	13 Jan 91	Al Jubayl	2,468	II MEF
	Merzario Britannia	RO/RO	FOR	16 Dec 90	9 Jan 91	Al Jubayl	3,689	II MEF
	Yannis II	BB	FOR	17 Dec 90	14 Jan 91	Ad Damman	1,599	II MEF
	Del Valle	BB	RRF	18 Dec 90	10 Jan 91	Al Jubayl	6,651	II MEF
	Anthos	BB	FOR	20 Dec 90	16 Jan 91	Ad Damman	1,275	II MEF
	Asian Breeze	RO/RO	FOR	22 Dec 90	16 Jan 91	Al Jubayl	8,.084	II MEF
	Cape Charles	BB	RRF	22 Dec 90	15 Jan 91	Al Jubayl	1,805	II MEF
	Atlantic Freighter	RO/RO	FOR	26 Dec 90	21 Jan 91	Al Jubayl	3,180	II MEF

FOREIGN PORTS

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
AMSTERDAM, NETHERLANDS	*Joseph Lykes*	BB	US	24 Jan 91	(U-TURN)		3,045	USA Ammo
	Galveston Bay	BB	US	2 Feb 91	(U-TURN)		4,744	USA Ammo
	Perla One	BB	FOR	13 Feb 91	(U-TURN)		9,283	USA Ammo
	Cape Carthage	BB	RRF	22 Feb 91	(U-TURN)		7,420	Sustainment Ammo
	Efdim Junior	BB	FOR	27 Feb 91	(U-TURN)		5,849	Sustainment Ammo
ANTWERP, BELGIUM	*Saudi Hail*	RO/RO	FOR	24 Nov 90	13 Dec 90	Ad Damman	6,272	2d COSCOM
	Canadian Forest	RO/RO	FOR	26 Nov 90	13 Dec 90	Ad Damman	4,165	2d COSCOM
	Mercury	RO/RO	US	27 Nov 90	11 Dec 90	Ad Damman	3,966	2d COSCOM
	Ocean Grace	BB	FOR	29 Nov 90	18 Dec 90	Ad Damman	1,552	2d COSCOM
	Fisher	RO/RO	US (MPS)	30 Nov 90	19 Dec 90	Ad Damman	5,152	2d COSCOM
	Cleveland	BB	US	2 Dec 90	17 Dec 90	Ad Damman	2,675	2d COSCOM
	Philippine Express	BB	FOR	2 Dec 90	23 Dec 90	Ad Damman	1,828	2d COSCOM
	Simiara Express	BB	FOR	2 Dec 90	24 Dec 90	Ad Damman	1,275	2d COSCOM
	Franina	BB	FOR	4 Dec 90	29 Dec 90	Ad Damman	1,449	2d COSCOM
	Pella	BB	FOR	7 Dec 90	28 Dec 90	Ad Damman	1,462	2d COSCOM
	Lyra	RO/RO	US	9 Dec 90	27 Dec 90	Ad Damman	4,138	2d COSCOM
	Delos	BB	FOR	9 Dec 90	31 Dec 90	Ad Damman	1,639	2d COSCOM
	Arastou	BB	FOR	10 Dec 90	29 Dec 90	Ad Damman	1,459	2d COSCOM
	Avlis	BB	FOR	10 Dec 90	29 Dec 90	Ad Damman	1,658	2d COSCOM
	San Sabastian	BB	FOR	10 Dec 90	1 Jan 91	Ad Damman	1,359	2d COSCOM
	Joseph Lykes	BB	US	15 Dec 90	31 Dec 90	Ad Damman	1,307	2d COSCOM
	Eleftheria K	BB	FOR	16 Dec 90	7 Jan 91	Ad Damman	1,656	3d AD
	Cape Horn	RO/RO	RRF	18 Dec 90	4 Jan 91	Ad Damman	12,355	3d AD
	Altenbels	BB	FOR	19 Dec 90	8 Jan 91	Ad Damman	1,906	3d AD
	Nancy Lykes	BB	US	20 Dec 90	8 Jan 91	Ad Damman	2,321	3d AD
	Nicole	Multi-Purpose	FOR	20 Dec 90	13 Jan 91	Ad Damman	2,109	3d AD
	Cape Monterey	BB	FOR	21 Dec 90	13 Jan 91	Ad Damman	1,560	3d AD
	Panormos Victory	BB	FOR	21 Dec 90	13 Jan 91	Ad Damman	1,584	3d AD
	Apman II	BB	FOR	23 Dec 90	12 Jan 91	Ad Damman	2,445	3d AD
	Enarxis	BB	FOR	23 Dec 90	13 Jan 91	Ad Damman	1,788	3d AD
	Saudi Abha	RO/RO	FOR	24 Dec 90	12 Jan 91	Ad Damman	9,181	3d AD
	Arcade Eagle	RO/RO	FOR	28 Dec 90	21 Jan 91	Ad Damman	1,335	3d AD
	Auto Champ	RO/RO	FOR	28 Dec 90	16 Jan 91	Ad Damman	6,568	POMCUS M998s
	Peris	RO/RO	FOR	28 Dec 90	21 Jan 91	Ad Damman	674	Force Modernization Eqp

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
ANTWERP,	*Canadian Forest*	RO/RO	FOR	3 Jan 91	25 Jan 91	Ad Damman	10,838	3d AD
BELGIUM (Con't)	*Pless*	RO/RO	US (MPS)	10 Jan 91	31 Jan 91	Ad Damman	2,322	3d AD
	Hirado Maru	BB	FOR (NC)	13 Jan 91	5 Feb 91	Ad Damman	3,465	3d AD
BENELUX (NEAR ROTTERDAM)	*Arcade Eagle*	RO/RO	FOR	9 Sep 90	2 Oct 90	Ad Damman	1,102	12th AVN BDE
BOGEN, NORWAY[7]	*Flemming Sif*[5]	Multi-Purpose	FOR	31 Dec 90	23 Jan 91	Ad Damman	3,708	Fleet Hospital 15
BREMERHAVEN,	*Cape Mohican*	SeaBee	RRF	24 Oct 90	DIW	Ad Damman	8,943	Canadian Forces Europe
GERMANY	*Cape Ducato*	RO/RO	RRF	25 Oct 90	14 Nov 90	Ad Damman	13,403	Canadian Forces Europe
	Cape Mendocino	SeaBee	RRF	25 Oct 90	15 Nov 90	Ad Damman	9,354	Canadian Forces Europe
	Jupiter	RO/RO	RRF	3 Nov 90	17 Nov 90	Ad Damman	10,620	Canadian Forces Europe
	Cape Inscription	RO/RO	RRF	20 Nov 90	6 Dec 90	Al Jubayl	6,767	2d ACR
	American Falcon	RO/RO	US	23 Nov 90	10 Dec 90	Ad Damman	4,069	2d ACR
	Cape Edmont	RO/RO	RRF	25 Nov 90	13 Dec 90	Al Jubayl	6,853	2d ACR
	Hauge	RO/RO	US (MPS)	28 Nov 90	19 Dec 90	Ad Damman	4,779	2d ACR
	Arcade Falcon	RO/RO	FOR	29 Nov 90	21 Dec 90	Al Jubayl	11,872	2d ACR/POMCUS
	Cape Douglas	RO/RO	RRF	29 Nov 90	18 Dec 90	Ad Damman	4,616	2d ACR
	Meteor	RO/RO	RRF	1 Dec 90	18 Dec 90	Ad Damman	3,540	VII Corps ARTY
	Capella	RO/RO	FSS	4 Dec 90	15 Dec 90	Ad Damman	9,774	VII Corps ARTY
	Cape Isabel	RO/RO	RRF	4 Dec 90	18 Dec 90	Ad Damman	4,368	VII Corps ARTY
	Regulus	RO/RO	FSS	6 Dec 90	17 Dec 90	Ad Damman	9,117	1st AD/VII Corps ARTY
	Cape Hudson	RO/RO	RRF	23 Nov 90	13 Dec 90	Al Jubayl	8,929	2d ACR
	Flichtelberg	RO/RO	FOR	6 Dec 90	25 Dec 90	Ad Damman	936	VII Corps ARTY
	Kubbar	BB	FOR (NC)	7 Dec 90	28 Dec 90	Ad Damman	3,278	1st AD
	Pollux	RO/RO	FSS	8 Dec 90	20 Dec 90	Ad Damman	7,574	1st AD
	Kahleberg	RO/RO	FOR	9 Dec 90	29 Dec 90	Ad Damman	1,307	1st AD
	Alycia	BB	FOR	11 Dec 90	1 Jan 91	Al Jubayl	1,990	1st AD
	Cape Lobos	RO/RO	RRF	13 Dec 90	4 Jan 91	Ad Damman	1,930	1st AD
	J Dlugosz	BB	FOR	14 Dec 90	2 Jan 91	Ad Damman	2,948	1st AD
	Merchant Promise	BB	FOR	15 Dec 90	3 Jan 91	Ad Damman	1,652	German HETs
	Cape Mendocino	SeaBee	RRF	16 Dec 90	5 Jan 91	Ad Damman	2,959	1st AD
	Skarvoy	RO/RO	FOR	16 Dec 90	10 Jan 91	Ad Damman	1,757	1st AD
	Vrahos	BB	FOR	18 Dec 90	7 Jan 91	Ad Damman	2,536	1st AD

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
BREMERHAVEN, GERMANY (Con't)	*Washington*	Seatrain	RRF	19 Dec 90		Ad Damman	5,641	1st AD
	Marie H	BB	FOR	20 Dec 90	11 Jan 91	Ad Damman	2,831	1st AD
	Zeron	RO/RO	FOR	20 Dec 90	11 Jan 91	Ad Damman	3,942	1st AD
	Bellatrix	RO/RO	FSS	22 Dec 90	4 Jan 91	Ad Damman	15,580	1st AD
	Banglor Kallor	BB	FOR	24 Dec 90	18 Jan 91	Ad Damman	4,053	1st AD
	Auto Champ	RO/RO	FOR	28 Dec 90	16 Jan 91	Ad Damman	4,077	1st AD
	Cape Inscription	RO/RO	RRF	28 Dec 90	13 Jan 91	Ad Damman	11,244	1st AD
	Skane Link	BB	FOR	28 Dec 90	21 Jan 91	Ad Damman	4,684	1st AD
	American Falcon	RO/RO	US	30 Dec 90	17 Jan 91	Ad Damman	8,947	2d AD
	Saudi Makkah	RO/RO	FOR	31 Dec 90	18 Jan 91	Al Jubayl	5,594	2d AD
	Regulus	RO/RO	FSS	4 Jan 91	17 Jan 91	Ad Damman	13,692	2d AD
	Kaptan B. Isin	RO/RO	FOR	9 Jan 91	6 Feb 91	Ad Damman	2,048	POMCUS
	Maersk Constellation	BB	US*	9 Jan 91	28 Jan 91	Ad Damman	6,882	Ground Vehicles/POMCUS
	Cape Hudson	RO/RO	RRF	10 Jan 91	27 Jan 91	Ad Damman	10,005	German HETS
	Cape Mohican	SeaBee	RRF	15 Jan 91	7 Feb 91	Ad Damman	2,538	German/FO Equipment
	Cape Isabel	RO/RO	RRF	21 Jan 91	4 Feb 91	Ad Damman	5,452	German/FO Equipment
	Merzario Britannia	RO/RO	FOR	31 Jan 91	24 Feb 91	Ad Damman	3,100	German/FO Equipment
	Zeron	RO/RO	FOR	5 Feb 91	27 Feb 91	Ad Damman	2,240	German/FO Equipment
	Skodsborg	RO/RO	FOR	7 Feb 91	28 Feb 91	Ad Damman	1,396	German/FO Equipment
	Cape Ducato	RO/RO	RRF	10 Feb 91	28 Feb 91	Ad Damman	4,846	German/FO Equipment
	Cape Edmont	RO/RO	RRF	17 Feb 91	(U-TURN)		3,034	German/FO Equipment
	American Falcon	RO/RO	US	21 Feb 91	2 Mar 91	Iskenedrun, TK	1,186	German/FO Equipment
CARTAGENA, SPAIN	*Joseph Lykes*	BB	US	21 Feb 91	(U-TURN)		5,455	USAF Ammo
CHINAE, KOREA	*Rover*	RO/RO	US	19 Dec 90	20 Jan 91	Jeddah	2,732	USAF Ammo
	Hanjin Damman	BB	FOR (NC)	13 Feb 91	(U-TURN)		9,022	Ammo
EEMSHAVEN, NETHERLANDS	*Toxa*	BB	FOR	23 Dec 90	16 Jan 91	Ad Damman	4,370	USAFs Europe Ammo
	American Prabha	BB	FOR	17 Jan 91	(U-TURN)		5,915	Sustainment Ammo
	Cape Breton	BB	RRF	29 Jan 91	(U-TURN)		6,783	USA Sustainment Ammo
	Paci	BB	FOR	4 Feb 91	(U-TURN)		5,481	USA Sustainment Ammo
	Vhahos	BB	FOR	23 Feb 91	(U-TURN)		7,441	USA Sustainment Ammo
EMDEN, NETHERLANDS	*American Shakti*	BB	FOR	11 Feb 91	(U-TURN)		7,873	USA Sustainment Ammo
	Encouragement	BB	FOR	26 Feb 91	(U-TURN)		7,189	Sustainment Ammo

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
GIBRALTAR, SPAIN	*Cape Isabel*[8]	RO/RO	RRF	26 Feb 91	12 Mar 91	Ad Damman	5,040	Assisted Combat Svc Spt Unit Eqp
GLEN DOUGLAS, SCOTLAND	*Cape Catoche*	BB	RRF	1 Feb 91	19 Feb 91	Al Jubayl	6,204	USMC Ammo
LISBON,	*Danah*	BB	FOR (NC)	25 Jan 91	15 Feb 91	Bahrain	7,914	Ammo
PORTUGAL	*Galveston Bay*	BB	US	14 Feb 91	(U-TURN)		6,312	Ammo
LIVORNO,	*Jolly Smeraldo*	RO/RO	FOR	8 Sep 90	20 Sep 90	Ad Damman	3,557	12th AVN BDE
(LEGHORN)	*Wadai*	BB	FOR	9 Sep 90	24 Sep 90	Ad Damman	1,605	12th AVN BDE
ITALY	*Noble Star*	BB	US (PREPOS)	14 Sep 90	28 Sep 90	Ad Damman	3,903	12th AVN BDE
	Cape Hudson	RO/RO	RRF	24 Nov 90	25 Jan 91	Ad Damman	555	USMC Containers
	Cape Borda	BB	RRF	13 Jan 91	25 Jan 91	Ad Damman	1,058	POMCUS
	Lyra	RO/RO	US	15 Jan 91	29 Jan 91	Ad Damman	3,777	POMCUS/HETS
	Merzario Italia	RO/RO	FOR	24 Jan 91	28 Jan 91	Turkey	2,634	Proven Force
	Green Lake	BB (VC)	US (NC)	28 Jan 91	9 Feb 91	Ad Damman	1,596	Force Modernization Eqp
	Senator	RO/RO	US	29 Jan 91	12 Feb 91	Ad Damman	3,020	CZ HETs/HEMTTs
	Strong Texan	RO/RO	US	30 Jan 91	8 Feb 91	Jeddah	504	USAF Vehicles
	Oslo (Bassro) Polar	RO/RO	FOR	2 Feb 91	19 Feb 91	Ad Damman	2,310	Force Modernization Eqp
	Maine	Seatrain	RRF	4 Feb 91	19 Feb 91	Ad Damman	3,788	POMCUS/M109/110s
	Merzario Italia	RO/RO	FOR	18 Feb 91	6 Mar 91	Ad Damman	7,581	POMCUS
NAHA,	*Danah*	BB	FOR (NC)	15 Sep 90	2 Oct 90	Bahrain	4,495	Navy Construction Mobile BN 7
OKINAWA	*Cape Edmont*	RO/RO	RRF	3 Jan 91	19 Jan 91	Ad Damman	3,690	II MEF
NEWPORT,	*Westman*	BB	FOR	27 Jan 91	9 Feb 91	Jeddah	10,647	Ammo
WALES	*Agios Spyridon*	BB	FOR	5 Feb 91	(U-TURN)		8,126	Ammo
	Avanti	BB	FOR	20 Feb 91	(U-TURN)		4,432	Ammo
NORDENHAM,	*Green Wave*	BB	US	3 Oct 90	22 Oct 90	Ad Damman	4,414	Ammo
GERMANY	*Cape Catoche*	BB	RRF	14 Nov 90	1 Dec 90	Ad Damman	5,274	Ammo
	Cape Inscription	RO/RO	RRF	21 Nov 90	6 Dec 90	Ad Damman	510	Units of BLC
	Cape Hudson	RO/RO	RRF	24 Nov 90	13 Dec 90	Ad Damman	555	Units of BLC
	Cape Farewell	LASH	RRF	25 Nov 90	31 Dec 90	Ad Damman	14,607	POMCUS/Ammo/78 M1A1
	Cape Edmont	RO/RO	RRF	26 Nov 90	12 Dec 90	Ad Damman	839	Units of BLC
	Cape Juby	BB	RRF	1 Dec 90	17 Dec 90	Ad Damman	6,097	Ammo

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
NORDENHAM, GERMANY (Con't)	*Cape Gibson*	BB	RRF	14 Dec 90	29 Dec 90	Ad Damman	15,410	Ammo
	Valenje	BB	FOR	16 Dec 90	10 Jan 91	Ad Damman	3,708	1st AD
	Unisierra	BB	FOR	22 Dec 90	10 Jan 91	Ad Damman	3,375	Ammo/1st AD
	Cornhusker State	TACS	RRF	24 Dec 90	11 Jan 91	Ad Damman	5,022	UBL Containers/1st AD
	American Shanti	BB	FOR	7 Jan 91	28 Jan 91	Al Jubayl	5,306	Ammo
	Mostwenn 4	BB	FOR	14 Jan 91	7 Feb 91	Ad Damman	6,805	USA Sustainment Ammo
	Neos	BB	FOR	21 Jan 91	17 Feb 91	Ad Damman	5,558	USA Sustainment Ammo
	Cape Clear	BB	RRF	25 Jan 91	13 Feb 91	Al Jubayl	5,116	USA Sustainment Ammo
	Agas	BB	FOR	2 Feb 91	(U-TURN)		6,808	USA Sustainment Ammo
	Advantage	BB	US (PREPOS)	5 Feb 91	(U-TURN)		11,743	USA Sustainment Ammo
	Samsun Honor	BB	FOR (NC)	13 Feb 91	25 Feb 91	Turkey	2,277	Proven Force Ammo
	Gallant II	BB	FOR	15 Feb 91	(U-TURN)		9,333	USA Sustainment Ammo
	Cape Farewell	LASH	RRF	19 Feb 91	28 Feb 91	Port Said	14,630	USA/Air Force German Eqp
	Enarxis	BB	FOR	19 Feb 91	(U-TURN)		6,160	USA Sustainment Ammo
	Mariner	BB	FOR	25 Feb 91	(U-TURN)		6,076	Sustainment Ammo
	Cape Bon	BB	RRF	27 Feb 91	(U-TURN)		6,959	USA Sustainment Ammo
	Del Valle	BB	RRF	2 Mar 91	(U-TURN)		2,541	Ammo
	Cumbrian Express	BB	FOR	4 Mar 91	(U-TURN)		5,019	USA Ammo
PUSAN, KOREA	*Key Splendor*	BB	FOR (NC)	18 Oct 90	9 Nov 90	Ad Damman	3,205	USAF Matting
RIDHAM, UNITED KINGDOM	*Green Ridge*	BB	US	11 Feb 91	(U-TURN)		8,563	USAF Ammo
	John Lykes	BB	US	21 Mar 91	(U-TURN)		8,480	USAF Ammo
ROTA, SPAIN	*Altair*[6]	RO/RO	FSS	14 Sep 90	23 Sep 90	Ad Damman	7,280	24th ID
	Cape Douglas[1]	RO/RO	RRF	8 Oct 90	22 Oct 90	Ad Damman	5,062	48/85 Medical BN/212d FA BDE
	Ashley Lykes[4]	BB	US	28 Oct 90	10 Nov 90	Ad Damman	2,760[10]	1st COSCOM
	Lopez[4]	RO/RO	US (MPS)	8 Nov 90			2,760[10]	1st COSCOM
ROTTERDAM, NETHERLANDS	*Algol*	RO/RO	FSS	23 Nov 90	5 Dec 90	Ad Damman	5,250	HHC VII Corps
	Saudi Makkah	RO/RO	FOR	25 Nov 90	7 Dec 90	Ad Damman	6,381	2d COSCOM
	Cape Domingo	RO/RO	RRF	27 Nov 90	15 Dec 90	Ad Damman	4,003	2d COSCOM
	Saudi Riyadh	RO/RO	FOR	27 Nov 90	10 Dec 90	Ad Damman	3,618	2d COSCOM
	Cape Henry	RO/RO	RRF	29 Nov 90	14 Dec 90	Ad Damman	4,968	2d COSCOM
	Zoella Lykes	BB	US	30 Nov 90	17 Dec 90	Ad Damman	2,161	2d COSCOM

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
ROTTERDAM, NETHERLANDS (Con't)	*Falcon*	BB	FOR	30 Nov 90	20 Dec 90	Ad Damman	1,947	2d COSCOM
	Bazias III	RO/RO	FOR	2 Dec 90	28 Dec 90	Ad Damman	1,409	2d COSCOM
	Cape Nome	BB	RRF	2 Dec 90	17 Dec 90	Ad Damman	2,007	2d COSCOM
	Ashley Lykes	BB	US	4 Dec 90	22 Dec 90	Ad Damman	1,583	2d COSCOM
	Equality State	TACS	RRF	4 Dec 90	20 Dec 90	Ad Damman	1,309	2d COSCOM
	Silago Express	BB	FOR	4 Dec 90	28 Dec 90	Ad Damman	1,664	2d COSCOM
	Atlantic Lilly	BB	FOR	5 Dec 90	25 Dec 90	Ad Damman	1,455	2d COSCOM
	ASL Cygnus	RO/RO	FOR	6 Dec 90	26 Dec 90	Ad Damman	5,079	3d AD
	Agios Spyridon	BB	FOR	7 Dec 90	26 Dec 90	Ad Damman	1,449	3d AD
	Cape Johnson	BB	RRF	7 Dec 90	24 Dec 90	Ad Damman	1,887	2d COSCOM
	Anderson	RO/RO	US (MPS)	10 Dec 90	29 Dec 90	Ad Damman	4,981	3d AD
	Cape Ducato	RO/RO	RRF	11 Dec 90	2 Jan 91	Ad Damman	7,940	3d AD
	Advantage	BB	US (PREPOS)	13 Dec 90	1 Jan 91	Ad Damman	3,916	3d AD
	Camilla	RO/RO	FOR	13 Dec 90	2 Jan 91	Ad Damman	1,930	3d AD
	Maine	BB	RRF	13 Dec 90	1 Jan 91	Ad Damman	2,067	3d AD
	Sangerhausen	BB	FOR	15 Dec 90	2 Jan 91	Ad Damman	2,529	3d AD
	Mistra	BB	FOR	17 Dec 90	7 Jan 91	Ad Damman	2,278	3d AD
	Cape Syros	BB	FOR	20 Dec 90	11 Jan 91	Ad Damman	2,643	3d AD
	RoRo Runner	RO/RO	FOR	21 Dec 90	12 Jan 91	Ad Damman	704	3d AD
	Vilja	BB	FOR	22 Dec 90	12 Jan 91	Ad Damman	2,316	3d AD
	Ruth Lykes	BB	US	23 Dec 90	11 Mar 91	Ad Damman	3,292	3d AD
	Mangalia	RO/RO	FOR	23 Dec 90	6 Feb 91	Ad Damman	6,729	3d AD
	Marina C	BB	FOR	25 Dec 90	8 Feb 91	Ad Damman	1,568	3d AD
	Lopez	RO/RO	US (MPS)	28 Dec 90	20 Jan 91	Ad Damman	8,968	3d AD
	Peris	RO/RO	FOR	28 Dec 90	11 Jan 91	Ad Damman	654	3d AD
	Tampa Bay	BB	US	28 Dec 90	14 Jan 91	Ad Damman	2,640	3d AD
	Naxos	BB	FOR	29 Dec 90	20 Jan 91	Ad Damman	2,140	3d AD
	Jade Bay	BB	FOR	30 Dec 90	23 Jan 91	Ad Damman	1,828	3d AD
	Pace	BB	FOR	1 Jan 91	24 Jan 91	Ad Damman	1,510	3d AD
	Jolly Smeraldo	RO/RO	FOR	1 Jan 91	2 Feb 91	Ad Damman	6,689	3d AD
	Saudi Riyadh	RO/RO	FOR	3 Jan 91	20 Jan 91	Ad Damman	6,287	32 AADC
	Altair	RO/RO	FSS	11 Jan 91	22 Jan 91	Ad Damman	12,660	3d AD
	Pless	RO/RO	US (MPS)	14 Jan 91	31 Jan 91	Ad Damman	8,753	VII Corps Containers
	Saudi Hail	RO/RO	FOR	14 Jan 91	4 Feb 91	Ad Damman	6,950	12th/54th Eng. BN
	Cape Isabel	RO/RO	RRF	19 Jan 91	6 Feb 91	Ad Damman	2,988	POMCUS/CZ HETS
SASEBO, JAPAN	*Cleveland*	BB	US	25 Jan 91	9 Feb 91	Al Jubayl	14,399	USAF/USMC Ammo

APPENDIX 10 (Con't)

PORT	SHIP	SHIP TYPE	SHIPPING SOURCE	SPOE DEPARTURE	SPOD ARRIVAL	SPOD LOCATION	STONS	LOAD
SOUTHAMPTON, UNITED KINGDOM	*Strong Texan*	RO/RO	US	5 Dec 90	2 Jan 91	Ad Damman	647	Fuel Barges
SUBIC BAY, PHILIPPINES	*Rover*	RO/RO	US	7 Jan 91	20 Jan 91	Ad Damman	10,412	USAF Ammo
	Santa Adela	BB	US	25 Jan 91	11 Feb 91	Al Jubayl	3,671	USAF/USMC Ammo
	Harmony Stove	BB	FOR	22 Feb 91	10 Mar 91	Ad Damman	1,532	USAF Ammo
SUDA BAY, CRETE[7]	*Bettina Danica*[5]	BB	FOR	3 Feb 91	18 Feb 91	Al Jubayl	1,210	USMC Ammo
TENGAN, OKINAWA	*Rover*	RO/RO	US	26 Dec 90	3 Feb 91	Ad Damman	3,650	USAF Ammo
	Santa Adela	BB	US	13 Jan 91	15 Jan 91	Subic Bay	1,749	USMC Ammo
	Cape Catawba	BB	RRF	27 Feb 91	(U-TURN)		3,586	USAF Ammo
TOMBOLO, ITALY	*Cape Farewell*	LASH	RRF	12 Dec 90	31 Dec 90	Ad Damman	6,297	Ammo
	Cape Flattery	LASH	RRF	13 Jan 91	17 Jan 91	Ad Damman	22,420	USAF Ammo
	Green Harbour	LASH	US (PREPOS)	31 Jan 91	15 Feb 91	Ad Damman	10,848	Ammo
	Austral Lightning	LASH	RRF	24 Feb 91	2 Mar 91	Jeddah	7,655	USAF Ammo
UNKNOWN[9]	*Santania*	BB	FOR	19 Aug 90	21 Sep 90	Ad Damman	2,287	Unknown
	Super Servant III	Heavy Lift	FOR	29 Aug 90	1 Oct 90	Bahrain	7,448	Unknown
	Northern Light	BB	RRF	10 Feb 91	13 Feb 91	Ad Damman	1,608	Ammo
	Kota Timur	Multi-Purpose	FOR	22 Feb 91	2 Mar 91	Naha, Okinawa	479	Ammo

**Maersk Constellation* is a Danish-owned ship; the Military Sealift Command Lift Summary Report shows it as a US-Flag Ship.

NOTE: During the period 7 Aug 90 through 10 Mar 91, some ships loaded more than once at the same port. Also some ships loaded at more than one port in the United States or Europe before departing for the US Central Command Area of Responsibility (USCENTCOM AOR).

APPENDIX 10 (Con't)

SOURCES:

This table was compiled from five sources: Military Sealift Command (MSC) Lift Summary Reports, Military Traffic Management Command (MTMC) Port Operations Recap Report, US Transportation Command (USTRANSCOM) Ship Voyage Report, USTRANSCOM Situation Reports (SITREPS), and MSC SITREPS. Each source was cross-referenced with discrepancies footnoted in detail.

The MSC Lift Summary Reports contain all ship loads of dry cargo delivered or U-TURN (cargo loading or en route at the beginning of redeployment on 10 Mar 91). They also include ship names, short tons, passengers carried, seaport of embarkation (SPOE) arrival and departure dates, and seaport of debarkation (SPOD) arrival date. The SITREPS provided SPOE or SPOD names. MSC uses the displacement method in computing tonnage, while MTMC and USTRANSCOM use conversion. Therefore, tonnage on the MSC reports will differ from the tonnage on the MTMC and USTRANSCOM reports. Statistics compiled by the USTRANSCOM Research Center have consistently used the MSC tonnage data; i.e., displacement method.

The MTMC Port Operations Recap Report contains all ship loadings of dry cargo by port. The reports include ship name, voyage number, pieces lifted, square feet, short tons (STONS) (conversion), measurement tons (MTONS), super cargoes, and units carried. The MTMC report does not show SPOE arrival and departure dates.

The USTRANSCOM Ship Voyage Report was compiled by the Crisis Action Team during Desert Shield/Desert Storm. This report contains ship voyages to include ship name, unit carried, STONS (conversion), MTONS, passengers, type of ship, SPOE departure date, and SPOD arrival date.

FOOTNOTES:

1 *Equality State* and *Cape Mendocino* arrived Rota, SP, for boiler repairs. Cargo transloaded to *Cape Douglas* at Rota for delivery to the AOR.

2 The *Gulf Banker*, loaded with 3d Armored Cavalry Regiment cargo, and the *Washington*, loaded with 75th Field Artillery Brigade cargo, developed engine problems soon after leaving Beaumont, and Houston, TX, respectively, for the AOR. Their cargo, totaling 3,915 STONS, was transloaded to the *American Condor* at Jacksonville, FL. These first loadings for the *Gulf Banker* and *Washington* are not included on the MSC or USTRANSCOM report. Therefore, tonnage for each ship cannot be verified.

3 The *Del Monte* developed a critical water leak while loading Combat Service Support/Heavy Equipment Transporter cargo at Beaumont, TX. Cargo was transloaded to the *Ponce* at Jacksonville, FL. Both loadings are included on all sources used. Therefore, tonnage is included as loaded both Beaumont and Jacksonville.

4 *Washington* arrived Rota, SP, for boiler repairs. Cargo transloaded to *Ashley Lykes* and *Lopez* at Rota for delivery to the AOR.

5 Ship voyages included on the MSC Lift Summary Report and the USTRANSCOM Ship Voyage Report as cargo loaded and delivered or U-TURN. These ship loadings are not included as cargo loaded on the MTMC Port Operations Recap Report.

6 *Antares* towed to Rota, SP, for repairs. Cargo transloaded to *Altair* for delivery to the AOR.

7 Bogen, Norway, and Suda Bay, Crete, included as SPOEs on the USTRANSCOM Ship Voyage Report. These ports are not included on the MTMC Port Operations Recap Report. The respective ship voyages reported as cargo loaded at these ports are included on the MSC Lift Summary Report. However, the MSC report does not contain ports by name.

8 *Jupiter* cargo transloaded to *Cape Isabel* at Gibraltar for delivery to the AOR.

9 Ship voyages included on the MSC Lift Summary Report as cargo loaded and delivered. These ship loadings/voyages are not contained in the MTMC Port Operations Recap Report or the USTRANSCOM Ship Voyage Report. Therefore, name of loading port cannot be verified.

10 *Washington* cargo (a total of 2,760 short tons) transloaded to *Ashley Lykes* and *Lopez* at Rota, SP. The separate tonnage transferred to the *Lopez* and *Ashley Lykes* cannot be verified.

11 *Trident Dusk* transshipped cargo to the *Canadian Forest*.

PREPARED BY: US Transportation Command Research Center.

APPENDIX 10 (Con't)

ACRONYMS:

AADC	Army Air Defense Command	ID	Infantry Division
ABN	Airborne	LASH	Lighter Aboard Ship
ACR	Armored Cavalry Regiment	LO/LO	Lift-On/Lift-Off
AD	Armored Division	MAW	Marine Aircraft Wing
ARTY	Artillery	MEB	Marine Expeditionary Brigade
AVN	Aviation	MEF	Marine Expeditionary Force
BB	Breakbulk	MI	Military Intelligence
BDE	Brigade	MPS	Maritime Prepositioning Ship
BLC	Basic Load Containers	MSS	Mobile Support Squadron
BN	Battalion	NC	No Charge
CAV DIV	Cavalry Division	POMCUS	Prepositioning of Material Configured to Unit Sets
CMD	Command	PREPOS	Prepositioning Ships
COSCOM	Corps Support Command	RO/RO	Roll-On/Roll-Off
CS	Combat Support	RRF	Ready Reserve Force
FA BDE	Field Artillery Brigade	TACS	Crane Ship
FLO/FLO	Float-On/Float-Off	T-AVBS	Aviation Logistics Support Ship
FO	Follow-On Equipment	UBL	Units of Basic Load
FOR	Foreign	UE	Unit Equipment
FSS	Fast Sealift Ship	USA	United States Army
FSSG	Force Service Support Group	USAF	United States Air Force
HEMTTs	Heavy Expanded Mobility Tactical Trucks	USMC	United States Marine Corps
HETs	Heavy Equipment Transporters	USN	United States Navy
HHC	Headquarters and Headquarters Company	VC	Vehicle Carrier

GLOSSARY

AB	Air Base
ACL	Allowable Cabin Load
AD	Armored Division (Army)
	Air Division (Air Force)
AE	Aeromedical Evacuation
AFB	Air Force Base
AFLC	Air Force Logistics Command
AFRES	Air Force Reserve
AIA	African International Airlines
AIRF	Aviation Insurance Revolving Fund
ALCE	Airlift Control Element
ANG	Air National Guard
AOR	Area of Responsibility
APF	Afloat Prepositioning Force
APL	American President Lines
APO	Army Post Office
APOD	Aerial Port of Debarkation
APOE	Aerial Port of Embarkation
ARC	Air Reserve Component
AUTODIN	Automated Digital Network
C3I	Command, Control, Communications, and Intelligence
C4S	Command, Control, Communications and Computer Systems
CAP	Civil Air Patrol
CAPS	Consolidated Aerial Port Subsystems
CAT	Crisis Action Team
CCJ3	USCENTCOM Director of Operations
CENTAF	USCENTCOM Air Force Component
CEO	Chief Executive Officer
CINC	Commander in Chief
CJCS	Chairman, Joint Chiefs of Staff
CNN	Cable News Network
CNO	Chief of Naval Operations
COMALF	Commander, Airlift Forces
CORE	Contingency Response Program
CRAF	Civil Reserve Air Fleet
CONUS	Continental United States
DART	Dynamic Analysis Replanning Tool
DA	Department of the Army
DCINC	Deputy Commander in Chief
DCU	Deployment Control Unit
DDN	Defense Data Network
DET	Detachment
DLA	Defense Logistics Agency
DOD	Department of Defense

DON	Department of the Navy
DOT	Department of Transportation
DTS	Defense Transportation System
EAD	Earliest Arrival Date
EST	Eastern Standard Time
FAA	Federal Aviation Administration
FEU	Forty-Foot Equivalent Units
FORSCOM	Forces Command
FPO	Fleet Post Office
FSS	Fast Sealift Ship
GAO	General Accounting Office
GDSS	Global Decision Support System
GSA	General Services Administration
GTN	Global Transportation Network
HET	Heavy Equipment Transporter
HMMWV	High Mobility Multi-Purpose Wheeled Vehicle
IAP	International Airport
ICMMP	Integrated CONUS Medical Mobilization Plan
ID	Infantry Division
ILA	International Lonshoremen's Association
ITV	Intransit Visibility
JAL	Japanese Airlines
JCS	Joint Chiefs of Staff
JDA	Joint Deployment Agency
JDC	Joint Deployment Community
JDS	Joint Deployment System
JLOTS	Joint Logistics Over-the-Shore
JOPES	Joint Operation Planning and Execution System
JOPS	Joint Operation Planning System
JSCP	Joint Strategic Capabilities Plan
JTB	Joint Transportation Board
JTIC	Joint Transportation Intelligence Center
JTRU	Joint Transportation Reserve Unit
JVIDS	Joint Visual Information Display System
KAL	Korean Airlines
KKMC	King Khalid Military City
KLM	Royal Dutch Airlines
LAD	Latest Arrival Date
LOGAIR	US Contract Logistic Airlift Service (Air Force)
LRI	Long Range International
LSA	Logistics Support Agreement

MAC	Military Airlift Command
MAIRS	Military Air Integrated Reporting System
MARAD	Maritime Administration
MAS	Military Airlift Squadron
MAW	Military Airlift Wing (Air Force)
	Marine Aviation Wing (Marine Corps)
MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Force
MHE	Material Handling Equipment
MILSTAMP	Military Standard Transportation and Movement Procedures
MOTSU	Military Ocean Terminal, Sunny Point, North Carolina
MPS	Maritime Prepositioning Ships
	Maritime Prepositioning Squadron (Marine Corps)
MPSA	Military Postal Service Agency
MSC	Military Sealift Command
MTMC	Military Traffic Management Command
NAF	Numbered Air Force
NAS	Naval Air Station
NATO	North Atlantic Treaty Organization
NDRF	National Defense Reserve Fleet
NMN	National Motorcoach Network
NPRN	National Port Readiness Network
NSDD	National Security Decision Directive
OCCA	Ocean Cargo Clearance Authority
OMB	Office of Management and Budget
OMS	Operational Maintenance Squadron
OPLAN	Operation Plan
OSD	Office of the Secretary of Defense
PL	Public Law
POL	Petroleum, Oil, Lubricants
PREPOS	Prepositioning Ships
PSD	Port Security Detachment
QUICKTRANS	Long-Term Airlift Service Contract (Navy)
RCAPS	Remote Consolidated Aerial Port Subsystems
RDD	Required Delivery Date
RFP	Request For Proposal
RO/RO	Roll-On/Roll-Off
RRF	Ready Reserve Fleet
RSU	Railway Services Unit
SAC	Strategic Air Command
SAMAREC	Saudi Arabian Marketing and Refining Company
SAR	Special Access Required

SAS	Scandinavian Airline System
SCEPC	Senior Civil Emergency Planning Committee
SCUD	Surface-to-Surface Missile
SECDEF	Secretary of Defense
SMESA	Special Middle East Sealift Agreement
SPOD	Seaport of Debarkation
SPOE	Seaport of Embarkation
SRI	Short Range International
SRP	Sealift Readiness Program
SWA	Southwest Asia
TAC	Tactical Air Command
TCC	Transportation Component Command
TPFDD	Time Phased Force Deployment Data
TQM	Total Quality Management
TTU	Transportation Terminal Unit
UAE	United Arab Emirates
ULN	Unit Line Number
USA	United States Army
USAF	United States Air Force
USAFE	United States Air Forces Europe
USAFR	United States Air Force Reserve
USAR	United States Army Reserve
USMS	United States Maritime Service
USN	United States Navy
USNR	United States Naval Reserve
USCENTCOM	United States Central Command
USCINCCENT	Commander in Chief, US Central Command
USCINCEUR	Commander in Chief, US European Command
USCINCTRANS	Commander in Chief, US Transportation Command
USEUCOM	United States European Command
USPS	United States Postal Service
USTRANSCOM	United States Transportation Command
UTC	Unified Transportation Command
WBEL	Wide-Body Elevator Loader
WS	Weather Squadron
WWMCCS	Worldwide Military Command and Control System

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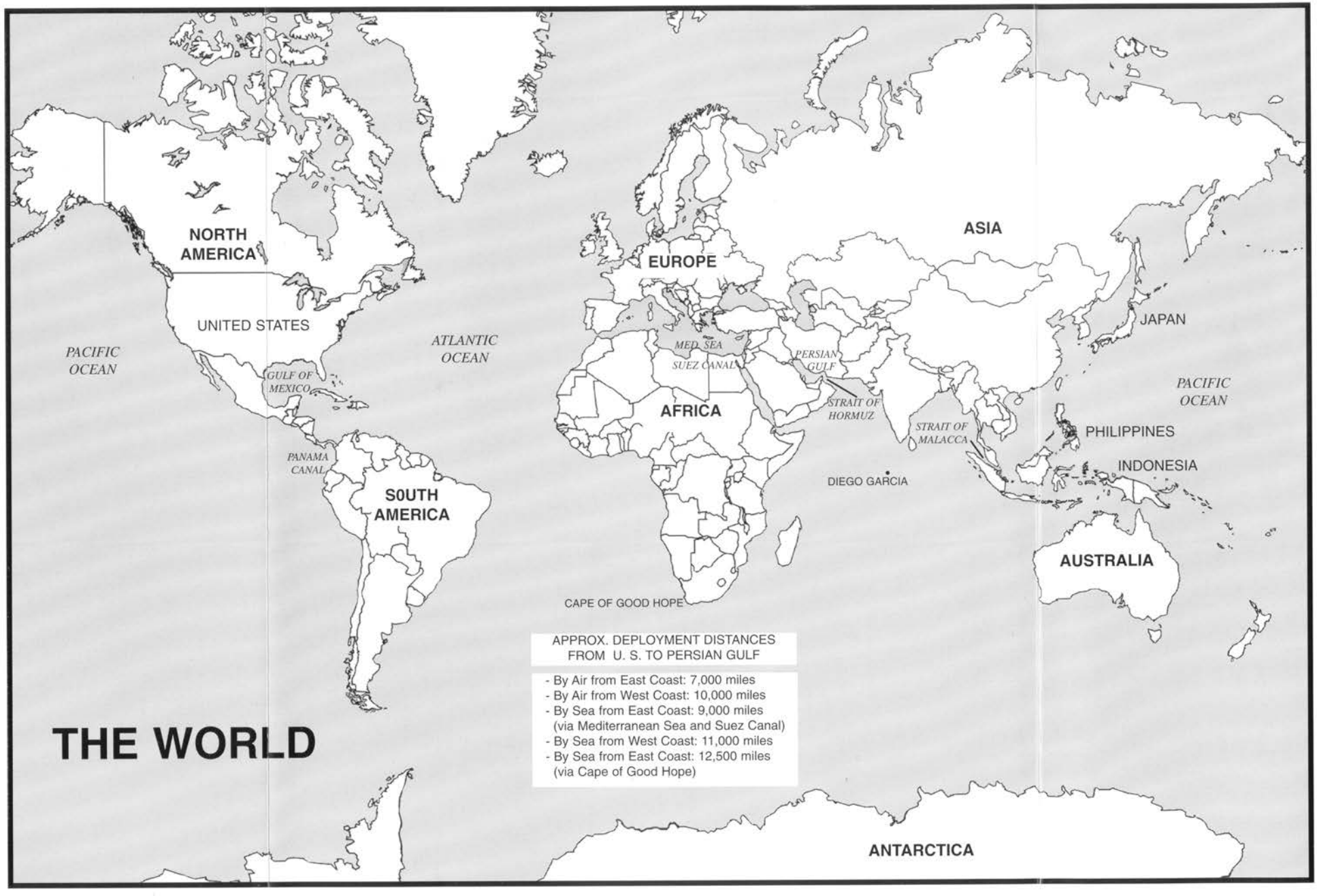
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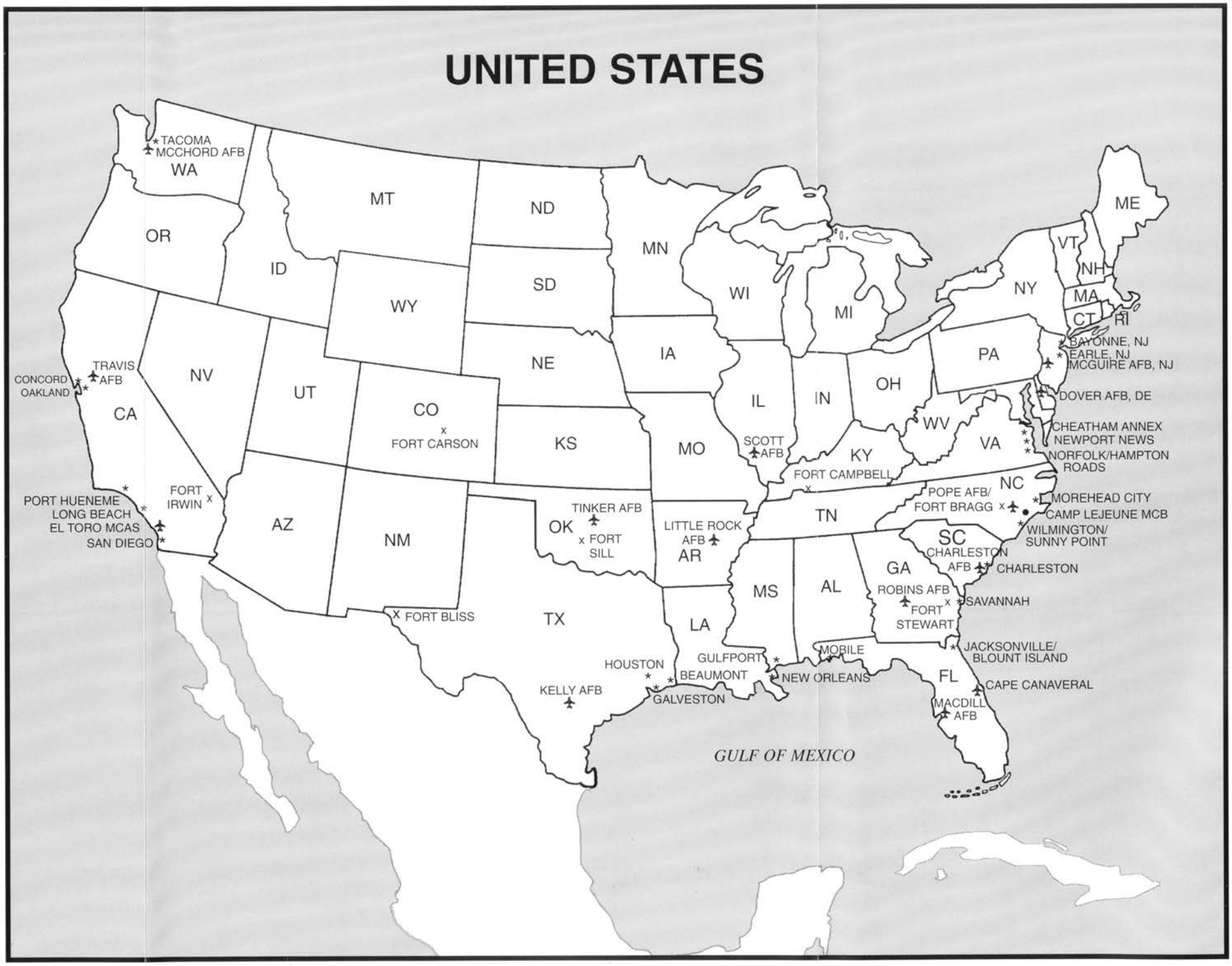
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