

# The Gulf War in Europe: An Air Force Medical Review

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*With over 500,000 US personnel facing ground combat in the Persian Gulf region the United States Central Command (CENTCOM) required back-up medical support. Headquarters, United States European Command (EUCOM), was tasked with this responsibility and determined that the major share of medical support would come from the United States Air Forces in Europe (USAFE). The Air Force (AF) medical team in Europe proudly signed up to the challenge. This article summarizes mission taskings by the AF medical service in Europe.*

## Changing Perspectives

The probability of war in the Gulf starkly revealed that USAFE would transition from a primarily front line fighter mission to a supporting role with significant medical emphasis. General Oaks, Commander-in-Chief, USAFE stated on several occasions that USAFE's number one mission for Operation Desert Shield/Storm (DS/S) was medical. This statement typified the scope of changes which occurred during the Desert Shield/Storm experience.

## Wartime Medical Concept

The USAFE Combat Casualty Care System was developed for a European general-war scenario which assumed that US airfields would be attacked early. Surviving peacetime medical facilities would be able to expand only minimally, and would be quickly overwhelmed by casualties. This situation led to the development of dispersed contingency hospitals which have full medical and surgical capability with associated support materiel in place and ready to use. The advantages of this concept are relative security and minimal activation time. Since development began in 1982, USAFE has established 5,750 contingency hospital beds.

USAFE medical support for Desert Shield/Storm was an amalgamation of the wartime concept described above and the peacetime system which remained ongoing throughout the Gulf War. Concepts and procedures were modified or newly developed, hospital staffing patterns were ad-

justed and the peacetime medical system expanded to accommodate the "dual" health care roles.

## Medical Mission Overview

During Operations Desert Shield/Storm, EUCOM was responsible for supporting CENTCOM with 5,500 beds. Expansion of EUCOM's entire peacetime medical system was inadequate for the mission. Given USAFE's responsive wartime medical capability, the USAFE Surgeon (SG) was tasked to provide 3,740 beds for CENTCOM support, more than 2/3 of EUCOM's total tasking. USAFE/SG accomplished this by expanding four peacetime hospitals and activating four contingency hospitals.

USAFE/SG was further tasked to develop aeromedical evacuation staging requirements, study the use of aeromedical staging beds as augmenting minimal care beds and establish blood donor and blood transshipment centers.



Figure 1. Numbered Air Force (NAF) regional areas.

Upon mission analysis, USAFE's medical augmentation requirements were identified and tasked to active Air Force sources in USAFE and the Continental United States (CONUS), as well as Air National Guard and Air Force Reserve Forces. Those alerted were either moved at the first opportunity or held on-call, pending the decision to employ.

In early January 1991, USAFE medical planners also developed support concepts for Joint Task Force (JTF) Proven Force, the Turkish-based offensive against Northern Iraq.

With facilities, plans and procedures in place, the challenging process of turning USAFE into the Air Force's largest medical system began.

## Command and Control

HQ USAFE/SG and medical unit commanders retained functional control of medical operations until the decision was made to activate contingency hospitals and aeromedical staging facilities (ASFs) on the continent and in the United Kingdom (UK). With the projected increase in medical operations, intermediate line commanders welcomed the establishment of temporary Numbered Air Force (NAF) Surgeons' Offices at 3AF in the UK, 17AF in Germany (GE), and 16AF in Spain (Fig 1).

### Abbreviations Used

A/E	.....	Aeromedical Evacuation
A/ECC	.....	Aeromedical Evacuation Control Center
A/ECE	.....	Aeromedical Evacuation Control Element
A/ELT	.....	Aeromedical Evacuation Liaison Team
AF	.....	Air Force
ASF	.....	Aeromedical Staging Facility
ATH	.....	Air Transportable Hospital
BDC	.....	Blood Donor Center
BTC	.....	Blood Transshipment Center
CENTCOM	.....	Central Command
CHPL	.....	Contingency Hospital Patient Locator
CINCUSAFE	.....	Commander-in-Chief, United States Air Forces in Europe
CONUS	.....	Continental United States
EUCOM	.....	European Command
FOL	.....	Forward Operating Location
GE	.....	Germany
JTF	.....	Joint Task Force
MASF	.....	Mobile Aeromedical Staging Facility
NAF	.....	Numbered Air Force
SG	.....	Surgeon
UK	.....	United Kingdom
US	.....	United States
USAFE	.....	United States Air Forces in Europe

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Expedited management of contingency hospital activation issues immediately validated the wisdom of establishing NAF/SG staffs. Regional command, control and coordination by the NAF/SGs strengthened medical operations while giving deployed medical unit commanders a "local" functional support authority. With the cessation of conflict, the NAF/SGs helped manage a ponderous redeployment effort, and figured heavily in effectively planning and coordinating the timely return of medical facilities to their pre-war configurations.

### Aeromedical Evacuation

With the introduction of United States forces into CENTCOM, USAF's peacetime aeromedical evacuation (A/E) system deployed members from Rhein Main Air Base, Germany, to help establish CENTCOM's A/E system. Concurrently, USAF's A/E system expanded at seven EUCOM airfields which were close to casualty receiving hospitals. Intertheater (strategic) A/E missions began in August 1990 utilizing C-141s, which evacuated more than 3,700 patients from CENTCOM to EUCOM before the war even started (Fig 2). The intertheater A/E system also transported over 7,400 patients from EUCOM to CONUS during the period August 1990 to May 1991.

An intratheater (tactical) A/E system was established to further distribute arriving CENTCOM patients to specialized hospitals in EUCOM. USAF and Danish tactical aircraft, along with German rotary-wing aircraft, were available to support this patient movement.

An A/E system is more than just airframes. Medical crews consisting of flight surgeons, flight nurses and aeromedical technicians were needed, along with specialized medical equipment for in-flight patient care. Supporting A/E Control Centers (AECCs) and A/E Liaison Teams (AELTs) coordinated and controlled A/E operations in the air and on the ground. Approximately 2,600 Air Reserve Component personnel augmented

the European A/E system and comprised the vast majority of A/E support during Desert Shield/Storm.

### Aeromedical Staging Facility (ASF) Deployment

ASFs are bedded medical holding facilities which provide patient reception, restabilization, holding and transfer services for A/E patients transiting an airfield (Fig 3). Seven various sized ASFs were established in EUCOM, totaling 1,450 beds. Buildings of op-

portunity near the flightline housed ASFs at Rhein Main (250 beds), Ramstein (250 beds), Nurnberg (50 beds), Torrejon AB Spain (250 beds), RAF Mildenhall (100 beds), RAF Waddington (150 beds) and RAF Upper Heyford (400 beds).

Manpower to staff the ASFs was provided by USAF medical personnel until relieved by approximately 1,000 CONUS Reserve forces personnel (Fig 4). Transportation of casualties between ASFs and medical

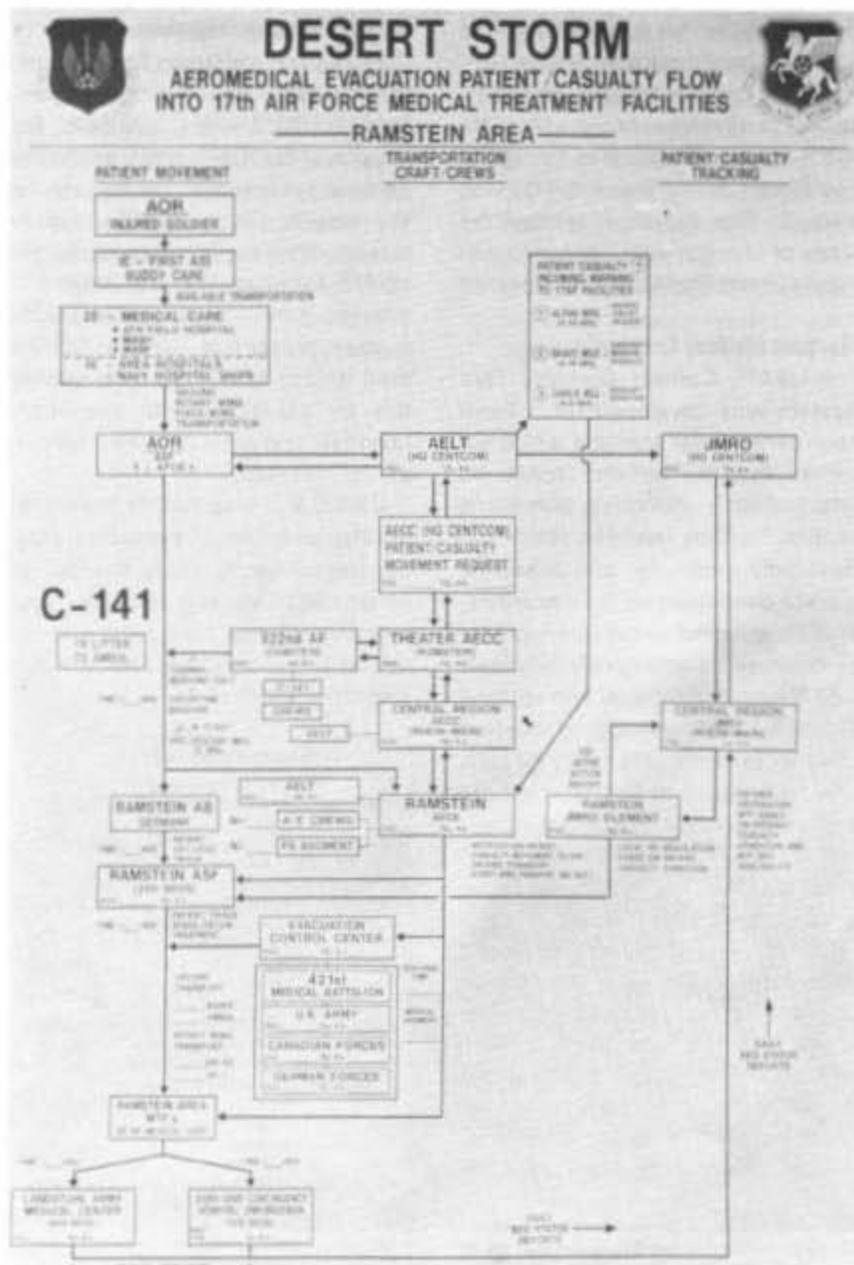


Figure 2. Aeromedical Evacuation (A/E) casualty flow chart.

treatment facilities was by ground and helicopter, part of which was provided by German, Canadian and US Army resources.

### Patient Tracking

Patient accountability is essential to manage bed availability, patient transportation and medical care. Equally important is the ability to answer family member questions about hospitalized military members. In response to this requirement, HQ USAFE developed the Automated Contingency Hospital Patient Locator (CHPL) system, which in peacetime was deemed cost prohibitive.

Using stand alone desk-top computers, the CHPL software was deployed in record time to Army, Navy and Air Force hospitals in EUCOM. The software interfaced with the

peacetime Automated Quality of Care Evaluation Support System (AQCESS) and required few procedural changes. CHPL reports were passed via the Defense Data Network to a jointly staffed central information center which updated the data base every six to 12 hours. Levels of inquiry ranged from family members to the Secretary of Defense.

### Contingency Hospital Activation

Contingency hospital development remains an ongoing process with a caretaker force at each facility (Figs 5 & 6). The initial emphasis was on obtaining buildings of opportunity, completing construction projects for structural integrity or functionality and obtaining medical supplies and equipment. While contingency hospitals have been exercised, no hospital had been

fully activated due to the significant cost in manpower and materiel. Activation time estimates were based on exercise experience and known task requirements such as cleaning linens and making beds, assembling surgical instrument packs and calibrating medical instruments.

Concurrent with the decision to use four USAFE contingency hospitals during Desert Shield/Storm, the respective caretaker forces initiated activation plans with the help of three clinical teams. On Oct 30, 1990, the clinical teams began evaluating facilities, equipment and supplies to determine shortfalls and anticipate augmenting staff requirements. Within two weeks, the majority of shortfalls had been identified for immediate acquisition and equipment verified as ready for use. With final preparations



Figure 3. Aeromedical Staging Facility (ASF) in flight line hangar.



Figure 4. Air Force Reservists moving patient from ASF to aircraft.



Figure 5. 750-Bed Contingency Hospital, RAF Nocton Hall, United Kingdom.



Figure 6. 500-Bed Contingency Hospital, Zweibrücken, Germany.



Figure 7. Intensive Care Unit, Contingency Hospital, RAF Little Rissington, United Kingdom.



Figure 8. Intensive Care Unit, Contingency Hospital, Nocton Hall, United Kingdom.

completed, the contingency hospitals at RAF Bicester, UK; RAF Little Rissington, UK; and Zweibrucken, GE were functionally ready to receive patients on Nov 14, 1990; RAF Nocton Hall, UK was ready near the end of November. At this point, medical staff was the only missing resource (Figs 7 & 8).

USAFE ultimately provided more than 3,740 hospital beds at four contingency hospitals and expanded peacetime facilities (Table I). The contingency hospital at RAF Little Rissington became the largest medical center in the Air Force, with 1,500 beds.

### Contingency Staffing and Peacetime Mission

With arrival of staff from CONUS hospitals, AF contingency hospitals in Europe had hundreds of doctors,

nurses, dentists, biomedical science specialists and administrators. There were medical technicians in every specialty from direct patient care to ancillary and support services. Even with abundant staffing, however, the dependent-care mission initially suffered, due to heavy base level taskings and the divergent locations of patients and contingency hospital staffs.

Unlike a European war scenario, military family members were present during Desert Shield/Storm. To complicate matters, US Army facilities which expanded to care for Gulf casualties terminated routine dependent care. The USAFE goal was to maintain peacetime health care levels while serving more Army dependents. However, had the war started before AF contingency hospital staffs arrived

from CONUS, USAFE's peacetime medical facilities would have ceased dependent care and expanded to their maximum bed capability.

Regarding the movement of 6,000 CONUS medical forces to Europe, the USAFE Surgeon's guidance was to deploy them "not a day too early, and not a day too late." Complicating this guidance was the uncertain timing for coalition offensive action and inadequate airlift priority for medical personnel.

Medical movement priority would have initially delayed full staffing of USAFE contingency hospitals until 21 days into the war. Conversely, the ground war was projected to fill EUCOM's expanded peacetime hospitals in a matter of days. This was a serious problem which was resolved in early January 1991, when airlift planners accelerated movement of CONUS medical personnel beginning on Jan 12, 1991. At the onset of the air war (Jan 17, 1991) 534 medical personnel had arrived to staff USAFE's expanded peacetime hospitals and establish initial capability at USAFE contingency hospitals. Medical deployments continued during the air campaign, and two weeks prior to the ground war, USAFE was able to meet the commitment of 3,740 USAF beds. Contingency hospitals, which provided the majority of the beds, required 4,342 CONUS medical personnel to staff them.

Table I. USAFE Hospital Beds for Desert Storm.

Type of Medical Facility	No. Hospital Beds
<b>Contingency Hospitals:</b>	
870th USAF CH, RAF Little Rissington UK .....	1500
310th USAF CH, RAF Nocton Hall UK .....	750
317th USAF CH, RAF Bicester UK .....	500
609th USAF CH, Zweibrucken GE .....	500
Total .....	3,250
<b>Peacetime Hospital Expansion:</b>	
7100 CSW Medical Center, Wiesbaden GE .....	286
401 TFW Hospital, Torrejon AB SP .....	124
48 TFW Hospital, RAF Lakenheath UK .....	155
20 TFW Hospital, RAF Upper Heyford UK .....	97
Total .....	662*
Grand Total .....	3,912*

\* 172 beds were available for peacetime patient care.

Personnel in contingency hospitals trained and remained on alert. Those working in USAFE's peacetime hospitals and clinics were inundated with additional war-related tasks while trying to care for an expanded patient load. Constant alert and overwork produced stressful situations in both environments.

To maximally employ the medical expertise brought into USAFE and try to level workload, a sharing of deployed personnel with peacetime hospitals and clinics was directed. All patients on waiting lists for specialty care throughout the command were identified and matched with specialists from the contingency hospitals and ASFs. As a result, deployed medical providers saw over 8,000 patients in a one-month period. The majority of patients would have otherwise encountered long waits or aeromedical evacuation to obtain their appointments. Virtually all previous waiting lists for specialized medical care in central Europe and the UK were eliminated.

In similar fashion, deployed dental personnel treated staff and other patients at nine fixed USAFE MTFs, for a total of 3,644 visits. This helped decrease the backlog of demand for dental care, especially for space available family members.

### Blood

In the early stages of DS/S, the USAFE Blood Program Officer was tasked to activate the CENTCOM Blood

Program and modify the EUCOM program. Within the first two months, USAFE deployed two Blood Transshipment Centers (BTCs) to CENTCOM, enabling the storage of more than 14,000 units of blood. Other USAFE BTCs supported blood moving from CONUS to CENTCOM and within EUCOM. The BTC mission to inspect, re-ice, store and ship blood products ensured that uncompromised blood arrived on time to meet each theater's needs (Fig 9).

Six prepositioned USAFE Blood Donor Centers (BDCs) were activated to increase collections for EUCOM contingency hospitals. In the first two weeks BDCs collected, classified and shipped 1,200 units of blood at a minimum volume of 50 units per day. From Aug 2, 1990 to Mar 3, 1991, USAFE BDCs collected 3,912 units of blood. The overwhelming support at USAFE blood drives minimized the requirement for blood components from the CONUS Armed Services Blood Program, and allowed the CONUS program to direct their support to CENTCOM.

USAFE's introduction of frozen blood storage and reconstitution technology was an important upgrade which flowed from Desert Shield/Storm (Fig 10). Over 4,000 units of frozen blood were shipped from the Armed Services Whole Blood Processing Laboratory in CONUS through USAFE BTCs to USAFE contingency hospitals. The light casualty load re-

quired no use of this blood; however, with a shelf life of 10 years, the frozen blood remains a valued standby resource.

### Aeromedical Services

Air combat operations during Desert Shield/Storm required the support of flight surgeons and aeromedical technicians from 14 USAFE bases. Those personnel deployed to Saudi Arabia, Turkey, the United Arab Emirates, France, Italy and Greece, where they provided clinical and preventive medicine services to flying squadron personnel. Flight surgeons routinely advised commanders of the physical and mental conditions of their aviators and made flight safety recommendations. Two USAFE Air Transportable Clinics were utilized at locations where flightline facilities were inadequate for field medical activities. USAFE aeromedical team members contributed directly to the low aircraft mishap rate and good health of deployed personnel.

### Medical Support to Forces Transiting USAFE

Many CONUS units transiting USAFE during Desert Shield/Storm verbally requested issue of chemical warfare antidotes and other medical items. In the absence of a process to validate requests and pay for the items, USAFE medical logisticians issued more than \$400,000 of War Reserve Material before a central fund cite was established. After action reporting



Figure 9. Inspecting and re-icing blood at a Blood Transshipment Center.

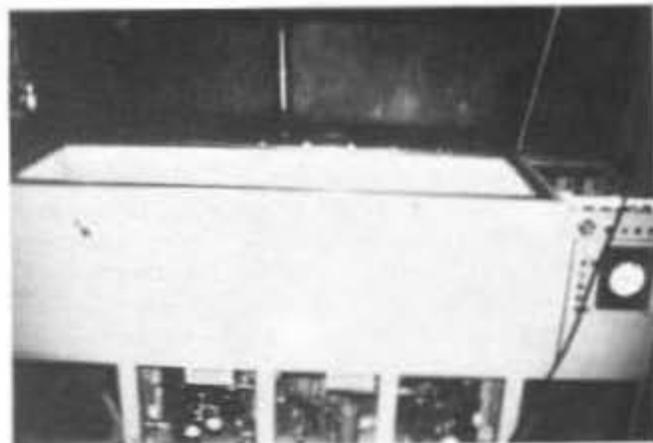


Figure 10. Harris Freezer for frozen blood storage.



**Figure 11.** Red Cross Volunteer Coordinator at Contingency Hospital, Zweibrücken, Germany.

suggested that operational fund cites similar to those used for REFORGER (Return of Forces to Germany) exercises become a standard planning requirement for future deployments.

### Volunteer Programs

The recruitment and placement of volunteers during Desert Shield/Storm was a complete success story. Medical volunteers were essential contributors at USAFE contingency hospitals, ASFs and expanded peacetime hospitals (Fig 11). Volunteers provided a wide variety of services, including medical duties within areas of professional expertise.

HQ USAFE/SG appointed the Command Nurse as the medical liaison for volunteer recruitment under Red Cross sponsorship. Standards, training plans and recruitment strategies were developed to support this initiative. Standards considered the legal aspects of patient care delivery, including professional licensure and cardiopulmonary resuscitation training. Volunteer training plans were critical since the general population is inexperienced in contingency medical operations. Medical and nonmedical activity descriptions were also developed and distributed to Red Cross offices and medical facilities.

Across USAFE, nearly 550 persons signed up as medical volunteers with the Red Cross during Desert Shield/



**Figure 12.** Mobile Aeromedical Staging Facility (MASF).

Storm. Military family member and non-deployed active duty response was overwhelming. To identify and quantify volunteers by specialty, a medical skills bank was established. This was very successful since many otherwise employed persons could be called upon to help in times of crisis. Military members often worked a regular job shift and then performed volunteer medical duties for three to four hours. Numbers of other full-time volunteers routinely augmented multiply tasked medical staffs. This outpouring of support was a tremendous boost for patients throughout USAFE.

### Joint Task Force

In early January 1991, USAFE medical planners developed the concept to support USAFE forces deployed to Turkey in Joint Task Force (JTF) Proven Force. The AF medical mission included hospitalization and aeromedical evacuation for all forces throughout Turkey, outpatient services, blood program support and environmental health services. Most deployed forces were located at Incirlik AB and at a Turkish air base at Batman, the forward operating location (FOL).

Functional command and control of AF medical forces was organized under the Air Force Forces (AFFOR) Surgeon, who reported functionally to the JTF Surgeon. The Incirlik hospital commander also acted as the

AFFOR Surgeon and worked closely with the JTF's two other component surgeons.

Concurrent with deployment of JTF Proven Force to Turkey in January 1991, most dependents departed Incirlik until mid-May 1991. The Incirlik hospital served all members at Incirlik and was the referral hospital for all forces in Turkey. The hospital's expansion from 20 to 60 beds was supported by 14 augmentees in selected specialties. Deployed flight surgeons provided clinical and preventive medicine services to assigned aviators and support personnel. The hospital maintained close professional relations with the nine additional AF and Army physicians at Incirlik and the three Army and AF physicians at Batman.

Immediate A/E capability was provided by in-place medical staff at the Incirlik hospital until relieved by 65 activated Reserve A/E medics. Upon arrival in Turkey, Reserve A/E forces established and exercised a Tactical Aeromedical Evacuation System which included an A/E Control Element (AECE), medical in-flight treatment crews, a 25-bed Mobile Aeromedical Staging Facility (MASF) and Aeromedical Evacuation Liaison Teams (AELTs).

The AECE was able to simplify A/E management in Turkey by collocating with the Joint Rescue Coordination Center at the Incirlik base command post. Opportune airlift was the only

airframe source for in-country A/E throughout JTF Proven Force. Incirlik-based helicopters and C-130 alert craft, as well as FOL based helicopters were used for A/E missions. Five A/E crews (25 members) were staged at Incirlik and responded to several emergency missions. Around the clock alert, routine aeromedical evacuations and training missions fully occupied A/E team members.

A 25-bed MASF was activated adjacent to the flight line at Incirlik to support the potential A/E casualty flow (Fig 12). The staff of 23 Reserve personnel conducted numerous simulated patient movement exercises, but actual patient flow did not necessitate MASF use.

Incirlik's 25-bed Air Transportable Hospital (ATH) was moved to the Batman FOL, pending authorization to set up and activate. Personnel in Germany were identified and "on call" for immediate deployment. Other per-

sonnel and equipment were also "on call" in the UK for immediate deployment to provide patient decontamination capability at the FOL.

The Incirlik Blood Transshipment Center (BTC) was activated and stocked at a level commensurate with the projected requirements. The Incirlik BTC operated under the guidance and support of the EUCOM Blood Program Office.

In summary, all Proven Force medical equipment except the ATH was set up, operationally exercised, and fully mission capable. Fortunately, most assets were required only for health maintenance and general, non-battle related medical care.

#### **USAFE DCS/Allied Support**

Not yet mentioned was the monumental effort put forth by other USAFE Deputy Chiefs of Staff offices and other agencies as well as host nations to support AF medical opera-

tions during Desert Shield/Storm. A fully equipped and staffed contingency hospital requires an extensive supporting infrastructure. Utilities, communications, transportation, billeting, rations, waste disposal, contract services and chaplain support are but a few of the requirements. Where the US could not fill the need, the host nations did. It was truly a team effort.

#### **CONCLUSIONS**

The number of Gulf casualties brought to Europe was fewer than expected from pre-war calculations, even at the peak of operations. All are thankful that the predicted number of casualties did not occur. Operation Desert Shield/Storm provided invaluable experience and new insight into planning for regional conflicts. The USAFE Combat Casualty Care System will undoubtedly be modified to incorporate the lessons learned from this operation. ●

