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# DESERT STORM CONFERENCE REPORT

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MARCH 3, 1992

**"THIS IS NOT A SMALLER VERSION OF A COLD WAR ARMY, THIS IS A NEW ARMY, A TRAINED ARMY. WE'RE READY TO GO ANYWHERE... WITH HEAVY FORCES, LIGHT FORCES, AND SPECIAL OPERATIONS FORCES."**

**"WE DON'T HAVE AN IDENTITY CRISIS... WE'VE GOT A PLAN, AND WE ARE CHANGING... WE'VE BEEN HERE FOR 216 YEARS SERVING THIS NATION, AND WE'LL BE HERE 500 YEARS FROM NOW!"**

**GENERAL GORDON R. SULLIVAN  
CHIEF OF STAFF OF THE ARMY  
From his speech to the Desert Storm  
Conference attendees**

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United States Army Training and Doctrine Command  
Office of the Commanding General  
Fort Monroe, Virginia 23651-5000  
FOREWORD

The Desert Storm Conference held at TRADOC Headquarters on 2-3 March 1992 provided senior leadership from fellow services an opportunity to reflect and conduct a "one year later" assessment of our recent battlefield victory.

This post-conflict assessment focused on lessons learned and emerging and changing dynamics of the battlefield that very well could change the way we fight. Air Force, Marine and Army leaders--active and reserve--discussed joint, combined, and service issues from the strategic, operational, and tactical realm.

This conference report will stimulate further analysis and discussion as we continue with new doctrine, training, leader development, materiel modernization, and organizational design, as well as give us a benchmark to measure progress in those lessons learned where no more discussion is required--only action to implement.

Appreciate the spirited participation of conference attendees. As we look to the future and shape our Post Cold War Forces, I encourage all to keep the dialogue going.

TRADOC--Where Tomorrow's Victories Begin!

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*Fredrick M. Franks Jr.*  
FREDERICK M. FRANKS, JR.  
General, U.S. Army  
Commanding

## INTRODUCTION

The United States Army Training and Doctrine Command (TRADOC) held a Desert Storm Conference on 2-3 March 1992 at Fort Monroe, Virginia. Its purpose — to get warfighters' feedback on lessons learned, focus lessons learned with the perspective of one year after the war, and collect any lessons that may have been missed. The distinguished list of attendees included Desert Storm corps, division, regiment and separate brigade commanders, corps and division command sergeants major, selected Desert Storm veterans, the TRADOC commandants, and key members of the TRADOC staff. General Frederick M. Franks Jr., commander, TRADOC, hosted the conference.

This report follows the conduct of the conference and provides discussion insight. It presents a general overview of the content of the conference, not a detailed examination of the issues covered. This report is not the "official Army lessons learned", and it does not substitute for, nor stand alone from, other completed or ongoing official lessons learned efforts. The issues discussed during the conference were drawn from various sources, including the personal experiences of attendees.

The Desert Storm Conference provided a forum where TRADOC leaders and the Army's warfighters could review lessons learned and ensure a common and consistent direction for TRADOC as it helps prepare the Army for war and as the architect of the future Army.

**“THE CENTERPIECE OF OUR DOCTRINE MUST BE  
HOW TO FIGHT AND WIN.”**

From General Franks' opening remarks to the conferees.



**TRADOC: WHERE TOMORROW'S VICTORIES BEGIN**

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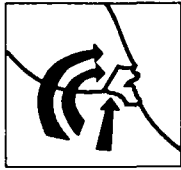
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# LESSON CATEGORIES

**DESERT STORM  
UNIQUE ...**



**PUT IN DESERT  
WARFARE KIT BAG**

**FIXES REQUIRED ...**



**WITHOUT FURTHER  
DEBATE**

**WORKED ...**



**SUSTAIN!**

**ISSUES  
FOR  
DISCUSSION**

**WORKED ...**



**SUSTAIN BUT TWEAK**

Each Desert Storm Conference briefing, with the exception of Battlefield Dynamics, generally categorized issues and lessons learned into five groupings. This report attempts to use descriptive phrases to assist the reader in categorizing issues and discussions. The reader will find these key phrases in italics to make them easier to pick out. The phrases vary somewhat for readability. Not all of the categories necessarily appear in every section or topic area. The five general categories are:

*"Desert Storm Unique. . . Put in desert warfare kit bag."* These items are not universal to all types of combat or environments. They have been captured for future desert conflicts.

*Things that "worked. . . sustain."* These are things that are mature. They work and don't need improvement in the near future.

*Things that "worked. . . sustain but tweak (improve)."* These items are basically sound but need some improvement to reach full potential.

*"Fixes required. . . without further debate."* These are things that are broken and need immediate attention.

*"Issues for discussion."* Many issues were discussed during the conference. Some issues were related to the topics briefed and some were not. As many of the relevant discussions as possible have been included to give insight into the direction and thinking associated with the issues.

## LESSONS LEARNED

### INTELLIGENCE

Major General Wesley K. Clark, Deputy Chief of Staff for Concepts, Doctrine, and Developments, Headquarters TRADOC, began the briefing on Operation Desert Storm lessons learned - specifically, organizations and materiel.

The tactical intelligence system *scored extremely high*, with much credit going to commanders and their preparation of the battlefield. Fielded prototype systems such as unmanned aerial vehicle (UAV), Hawkeye, Trojan Spirit, and Tactical Exploitation of National Capabilities (TENCAP) also *worked well but need some adjustment*. Organic military intelligence units at corps and division level were valuable but may *need adjustment* also.

Five *shortcomings* were discussed: how to process and distribute imagery; communications capability to support intelligence distribution; modernization of intelligence below division; the capability to field ade-

quate tables of distribution and allowances (TDA); and the conduct of battle damage assessment (BDA). Currently, TRADOC and the Air Force's Tactical Air Command are *working on BDA issues*.

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**The tactical intelligence system scored extremely high, with much credit going to commanders and their preparation of the battlefield.**

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*Other issues* that were discussed: organizational/structure shortfalls; brigade reconnaissance capability; and imagery collection profiles. TRADOC is *working the doctrine* to get intelligence from echelons above corps (EAC) down-linked to brigade level. The points were made that we need

to use intelligence liaison officer (LNO) teams at higher headquarters and adequate maps must be provided for tactical operations.

*Fixes are planned* in the following areas:

Imagery - fund the TENCAP system in FY 94 to divisions. Augment dissemination with Spirit communications capability in FY 93-94. Field a common ground station to brigade level in FY 94-98.

Distribution - create a "seamless" distribution architecture with special purpose military intelligence communications (new nets).

Modernization - replace all division systems (TEAMMATE, TACJAM, TRAILBLAZER) during this decade, and add new capabilities, such as UAV.

Target Damage Assessment/BDA - new doctrine is being written (FM 6-20-10), and Joint Intelligence Centers and Corp Military Intelligence Support Elements (CMISE) are being reorganized.

Brigade reconnaissance - pro-





vide military intelligence direct support companies to each maneuver brigade [UAV, Joint Surveillance Target Acquisition Radar System (JSTARS); ground station modules (GSM); and ground based common sensor (GBCS)].

## MANEUVER

### Aviation

*Munitions and helicopters* were high on the list of aviation hardware that *worked*. Munitions performed better than expected, and the attack/armed helicopter's superiority was clearly demonstrated.

Other areas which *worked but require* continued *improvement* were: "early on" reconnaissance and security coverage by AH-64 units; modernized aircraft/equipment such as AH-64, OH-58D, UH-60, and CH-47D; Army aviation night capability; and aviation support battalions.

*Needed improvements are required* for: secure communication architecture for fighting units; coordinated Army airspace command and control (C2) systems; unit manning authorizations to sustain wartime operational tempos; and situational awareness on a dynamic battlefield.

Corrosion kits are *now available* to combat blade wear from sand abrasions, and particle separators are being procured to improve component life, reliability, and maintainability. While these are steps in the right direction, the areas of sand abrasion and dust ingestion *need additional research and development*.

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**Munitions performed better than expected, and the attack/armed helicopter's superiority was clearly demonstrated.**

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One *project underway* to meet the needs of aviation in the area of data burst target communications is an approved and funded Enhanced Airborne Target Handover System. Also, a TRADOC *doctrinal review* is *underway*; maneuver control system and mobile subscriber equipment data communications are *being fielded*; and an aviation high frequency (HF) radio program is now

*being established*.

*Manning issues are being addressed* through a U.S. Army Reserve (USAR) augmentation plan and a Forces Command (FORSCOM) directed Reserve/Active Component (RC/AC) integration effort.

*Changing battlefield tactics have been addressed* with the Global Positioning System (GPS) requirement for all aircraft. Additionally, *operational requirements* for an aviation mission planning system, HF radios for extended range operations, and command and control consoles *have been drafted*.

*Other issues to be resolved* include utilization and availability of aviation LNOs in planning headquarters, the capability of aviation forward support battalions, Class IX (repair parts) funding, and rearming/refueling for AH-64 battalions. Other concerns involve airborne C2 suites for ground and aviation maneuver commanders and requirements to resolve aerial observer manning and training.

### Infantry

The M2 Bradley Fighting Vehicle (BFV) *proved* itself *survivable and mobile* on the battlefield with the tube-launched, optically tracked, wire-guided (TOW) missile and chain gun acting as a highly lethal combination. Maintenance reliability rated excellent.

The M113 Armored Personnel Carriers were very *reliable but slow*.

The Improved TOW Vehicle (ITV) was *too slow* to be effective, according to reports. A dedicated anti-tank unit needs another vehicle to operate from. Light forces lacked an adequate anti-armor capability.

An *issue for discussion* was the Combined Arms Maneuver Battalion (CAMB). A point of debate arose over CAMB versus Mission, Enemy, Terrain, Time-Troops task organization. CAMB could facili-

tate combined arms training, but logistic shortcomings make it difficult to support. *A common base for the heavy battalion is needed.* The last point stressed flexibility: *maintain the capability to mix and match.*

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### **The M2 Bradley Fighting Vehicle (BFV) proved itself survivable and mobile on the battlefield...**

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Solutions to the ITV problems centered primarily on a *review (in progress)* of Echo Company's effectiveness. Light and early entry force effectiveness *could be enhanced* with a better anti-armor capability, in addition to the fielding of JAVELIN (FY 96), Armored Gun System (AGS) (FY 97), improved target acquisition system (FY 97), and development of the Non-Line of Sight-Combined Arms demonstration/validation program. The need for an improved commanders vehicle based on the Bradley was also highlighted.

#### **Armor**

Three aspects of armor in a tactical environment that *worked* were the mine plows, the four-company task force organization, and the fighting executive officer concept. The M1 Abrams tank *needs further refinement* in the areas of *reliability, survivability, and lethality.* It was pointed out that the Department of Defense (DOD) made the decision to move to a common fuel and that *implementation plans have already been*

*Discussion suggested a need* to identify which vehicles and what power source will be used for GPS in heavy units. The impact wrench for the M2A2 was very useful and should

be adapted to other systems. The transfer pump *needs work* to be effective. Some commanders thought that changing to a single fuel (JP8) *might be a mistake.* The question arose over which fuel and how volatile. Is JP8 the right fuel? An independent smoke generator would be needed. Is it affordable and compatible?

Six issues and possible answers to the M1's shortcomings began with excessive tank air filter maintenance. A self-cleaning air filter is *proposed.* Excessive consumption and fuel resupply will be eased with the *addition* of an auxiliary power unit (APU) *funded* in FY 92-93. The poor ability

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### **The deployable Army requires light cavalry...**

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to acquire, identify, and engage targets at extended ranges is being partially addressed with the implementation of an optics improvement program. An azimuth indicator and positioning system on tanks *will enhance* the ability to accurately

orient and direct fires.

Excessive time and effort to reload the coaxial machine gun from ready/semi-ready storage wells will *require a design study* of the ammunition wells and quick-change racks. Extensive use and environmental stress showed current tank batteries are unreliable, but installing APUs *will extend* battery life and reduce stress.

#### **Scouts and Cavalry**

There was overwhelming agreement that organization and equipment of cavalry and scout units at all echelons be standardized. Long range finders on tanks were invaluable to range enemy equipment, but there is a real-world *need for increased range* on all employed optics.

A concern was voiced over the number of tanks assigned to the division cavalry. Also, Operation Desert Storm combat showed that a mixture of tanks and Bradleys enabled the scout vehicles to survive. Feeling the *mixture works*, the Army has approved an M1 to M3 mix ratio of 3 and 5 in division cavalry platoons. The M3 is also *excellent* in the reconnaissance role.



For air scout platoons to be effective, they have to be properly equipped and report to the division commander. The Army *must field* a deployable light cavalry to be used as part of the early entry force in support of strategic operations. The deployable Army requires light cavalry to broaden its security zone and minimize the threat of surprise attack.

### FIRE SUPPORT

Field artillery units delivered more throw weight during a 30-minute period of Operation Desert Storm than was delivered in an 8-hour period during World War II. This *highlights the advances in fire support technology.*

The multiple launch rocket system (MLRS), a free-flight, area fire, artillery rocket system, filled an existing void in conventional fire support and had an unpredicted psychological effect on the enemy during Operation Desert Storm. All commanders were *very supportive of more MLRS* in the division structure. The field artillery units provided all weather support, counterfire capability, and *proved effective* in destroying enemy targets with their precision munitions. The ammunition

resupply vehicle (M992) was *very mobile and survivable*. The Fire Support Team Vehicle for the future battlefield will be a BFV updated with modified optics. These updates and the new Paladin (M109A6) howitzer *will provide* the field artillery with *greater mobility and agility.*

All parties agreed that considerable work and effort *must be expended* to improve the interoperability between AC and RC field artillery units.

### COMMAND AND CONTROL

During Operations Desert Shield and Desert Storm, the U.S. Army established the largest automatic switched voice network in history.

Single Channel Ground and Airborne Radio System (SINCGARS) provided *extremely reliable* communications. Commanders and users recommended that SINCGARS *fielding be expedited* by the Army's leadership. There is a *need to leverage commercial communications* systems to augment and network with our tactical communications at theater, corps, and division level; especially during contingency operations.

According to General Franks,

"Eighty percent of command and control within VII Corps was nonelectronic during Operation Desert Storm. A sound plan is essential; everyone must understand the commander's intent and act on it without delay."

If a soldier knows the intent and understands the plan he'll accomplish the mission.

### ENGINEER

All participants at the conference spoke with one voice when it came to discussing the engineers' old and varied equipment. Without hesitation, they all agreed it *needs updating*. The recent engineer restructure provided the *correct mix* for combat, *but* there is a *need for more RC/AC interface* during all phases of training. Combat engineer units were *very responsive* in supporting field commanders and solving breaching problems.

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**According to General Franks, "... A sound plan is essential; everyone must understand the commander's intent and act on it without delay."**

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The combat engineer vehicle and the armored vehicle launched bridge were targeted by engineers and commanders as *too slow*. They were not able to keep up with M1 equipped maneuver forces. In this regard, accelerated fielding of the M1 Breacher and M1 Heavy Assault Bridge *will receive funding* in FY 96-97. Rewiring instructions were published to correct a poor reliability rate on the mine clearing line charge firing devices.



## COMBAT SERVICE SUPPORT

An overriding concern of most commanders at division and higher level was the command and control of the medical units supporting them.

There was *discussion* that the division should have command and control of medical units.

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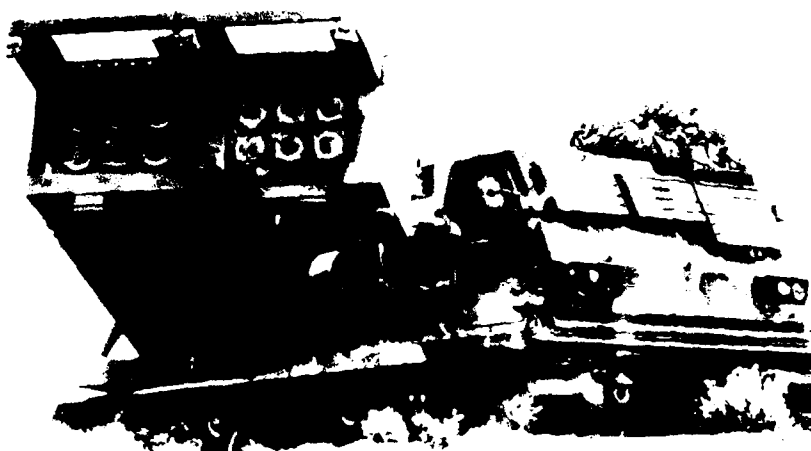
**The needs of soldiers, ranging from postal services to shower and laundry support, are under review.**

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Despite the low number of casualties in Operations Desert Shield/Storm, some commanders felt a *need* for the Army to *review* its medical evacuation support capabilities and requirements. The conference recommended a study of the medical force structure to determine if it is structured and equipped to support the future battlefield.

Some commanders saw a real problem in medical evacuation and felt the low number of casualties during Operation Desert Storm failed to combat test or validate current systems. *Army Medical Department is reviewing* hospitalization doctrine, medical organization design, and has submitted an operational requirements document for UH-60Q Blackhawk helicopters to bolster medical evacuation capability. The very low disease and non-battle casualty rate during the operation was a *real success*.

Field feeding issues elicited an emotional response from all of the leaders. They all agreed that the entire process *requires a thorough review*, from the distribution of Class I supplies and water to the capability of cooks to prepare food in the field. The commandant, U.S. Army Quar-



termaster School, explained that a review currently is in progress.

The *needs of soldiers*, ranging from postal services to shower and laundry support, are *under review*. New doctrine and tables of organization and equipment are *being accelerated* for FY 93 to correct long-standing problems in these areas.

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**The very low disease and non-battle casualty rate during the operation was a real success.**

---

The conference addressed the lack of enemy prisoner of war expertise within the AC. The Army of FY 99 will contain an AC cadre Enemy Prisoner of War Information Center (EPWIC) composed of 17 soldiers. The EPWIC *will provide limited but sufficient* EPW expertise to contingency operations in the future.

The Departments of Defense and the Army *need to review* the entire casualty notification system. Modern technology and satellite communications allow unit members to call home and informally pass casualty

information long before the official notification is completed. The leaders emphasized that this is a very serious problem which requires quick and accurate battlefield investigation so appropriate and prompt casualty notification can be made. The system *must be streamlined*.

## AIR DEFENSE ARTILLERY

The doctrinal concept of an organic, corps-level, air defense artillery (ADA) organization *worked* during Operation Desert Storm.

The Patriot Advanced Capability (PAC II), even with its design limitations, *countered the tactical ballistic missile threat*. Modernization of air defense artillery *starts* with the Stinger Fighting Vehicle in FY 94 and a corps surface-to-air missile requirement is being incorporated into doctrine. The Patriot PAC III is *funded* for FY 96. A light special interim sensor will be deployed in FY 92 and a forward area air defense system ground based sensor in FY 97. A lack of modernized ADA systems at corps, division, and below; limited anti-tactical defense assets; the capability to perform target acquisition, identification; and C2 *require future fixes*. This modernization

should include LNO teams to support joint and combined operations and answers to ease some restrictive antifratricide measures.

## SOLDIERS

The fielding of soldiers support items received *enthusiastic and positive responses* from participants. Soldier support items fielded during Operations Desert Shield/Storm are indicated on the following list:

- 300,000 ballistic/laser protective spectacles
- 100,000 sun, wind and dust goggles with laser lenses
- 8,000 SPH4 aviation helmet laser visors
- 300,000 desert field jackets
- 250,000 pairs of desert boots

Distribution of soldier comfort items was *not* supported by Army-Air Force Exchange Service operations during the initial arrival phases of theater buildup. The Department of Defense should consider reinstituting sundry packs in the supply system for deployed units. Sundry packs were used during the Vietnam era and filled a void during many stages of combat theater development. The United States Army Soldier Support Center is *working this requirement*.

The TRADOC system managers must watch equipment size and weight requirements for the individual soldier. Some combat soldiers exceeded their limits.

## COMBAT IDENTIFICATION

We must recognize that we will never completely prevent the possibility of fratricide. Fratricide will always be a risk in battle, but the *Army is committed* to minimizing the risks through positive action to improve combat identification. The watchwords here are proper train-

ing, proper planning, and proper equipment.

Toward this end, mobile liaison teams were assigned to U.S. forces, and special operations teams were dispatched to coalition forces. Positive control procedures and rules of engagement were used in Operation Desert Storm. Correct application of workable rules and procedures *must be aggressively pursued* during training and must continue to be *written into* all of our doctrine.

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**... we must conduct quick, impartial fratricide investigations. . . results . . . must be released quickly and openly.**

---

Training discipline and good offensive training are the best force protection from fratricide. Commanders must be attuned to situational awareness and optimize the benefits of systems such as GPS and JSTARS to enhance combat identification.

The *likely solutions* to this issue lie in the improvement of *doctrine, training, leader development, organizations*, and applications such as:

- Joint/combined indirect fire control and fire support coordination
- Training to identify thermal images
- Brigade reconnaissance capability

We also are *pursuing materiel solutions* to enhance:

- Situational and positional awareness
- Positive target identification at the maximum effective range

of weapons.

The warfighting leaders expressed a *real concern* over the possibility of friendly Identification Friend or Foe (IFF) devices falling into the hands of the enemy. Susceptibility to exploitation of any IFF system must be carefully weighed against its benefit. An adversary could potentially inflict far more casualties using friendly IFF than would result from incidents of fratricide.

Warfighting leaders also said we must conduct quick, impartial fratricide investigations. The results of these investigations must be released quickly and openly.

We *must improve* soldiers' awareness of the sources of fratricide risk through training and leader development. Training to reduce fratricide must be augmented by the best technology available and *must maintain* the aggressiveness of the soldier.

## NUCLEAR, BIOLOGICAL, CHEMICAL

Nuclear, biological, and chemical (NBC) *unit infrastructure is sound*. The rapid fielding of NBC reconnaissance equipment is *underway*. The Army fielded 49 modified German Fox vehicles during Operation Desert Storm and 75 additional systems are funded in FY 93-94.

The *required* NBC *fixes* are: biological and standoff chemical detection and warning capability; NBC protection clothing to match mission profiles; and lightweight alarm capabilities.

There is a system improvement program that will convert a decontamination company to a reconnaissance company in XVIII Airborne Corps in FY 93.

## TRAINING AND LEADER DEVELOPMENT

### TRAINING

Major General Dennis P. Malcor, Deputy Chief of Staff for Training, Headquarters TRADOC, gave the following assessment: "Based on volumes of Desert Storm lessons learned, two areas consistently surfaced as good news stories . . . training and leader development." The Army fought as it had trained, and it was very successful. There is always some room for improvement, but the Army's training system of institutional, unit, and self-development training is on track.

*Training elements that worked* were described first during this portion of the conference. The Army's training system, training doctrine (FMs 25-100, 25-101), and training publications help sustain the excellence and relevance of training and leader development. The Combat Training Centers (CTC) provided the Army its battlefield focus and should continue to be supported.

*Training elements that worked but need improvement* were covered next. As the Army incorporates change and adapts to the post-Cold War future, it may need to modify the

CTCs. The Army's master gunners in tank and Bradley units were excellent. Tank and BFV gunnery was good, but IFF needs to be improved. Joint operations also worked, but strategic to operational linkages and the ability to command and control large units on the move need to be

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**AFTER EVERY WAR THE PRIMARY LESSON LEARNED IS THAT WE FOUGHT AS WE TRAINED.**

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worked. There is a need for commanders and staffs who can work at all levels to meet the demands of fighting the post-Cold War Army. Linguist training is also a challenge. Although the specific threat is illusive and the intentions of nations are difficult to predict, we need to define what languages are needed and how to maintain proficiency. Training for the Individual Ready Reserve (IRR) needs to be relooked so that we have retraining packages in place when needed. The only remaining issue is whether the field

wants us to continue with training individuals or training crews/squads.

RC training strategies require study to identify a workable start point and resource requirements for post-mobilization training. Army Reserve training divisions and schools are a valuable resource for future operations but could be better equipped and employed. Training support packages for units in a theater of operations can be developed to enhance the maintenance of critical skills before combat operations commence.

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**"TRAINING IS THE GLUE THAT HOLDS THE ARMY TOGETHER . . ."**

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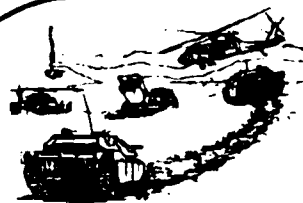
GENERAL SULLIVAN, CSA

*Some training areas do require a fix.* The first issue identified was how to replicate and integrate counterfire into CTCs and practice protection of the force. Simultaneous attack of the enemy in-depth is another challenge for peacetime training. At the strategic level, the Army requires the development of a theater-level training program to train the necessary EAC. Combat units breached complex obstacles during the war, but drills and equipment must be used to maintain proficiency.

Casualty reporting requires improved speed and accuracy. The premobilization training strategy for Round-Out/Round-Up brigades is being addressed. Tasks need to be identified for RC combat arms, combat support, and combat service support units to ensure they are focused

### TRAINING & LEADER DEVELOPMENT

THE BOTTOM LINE FIRST



**Training and leader development in Desert Storm were good news stories**



on exactly what tasks can be trained during pre-mobilization, and then what must be accomplished during post mobilization.

Two additional training issues were raised for discussion. The first was the adequacy of fieldcraft, which was generally considered good in combat and combat support units, but needs work in combat service support units. The second issue was the requirement to train more soldiers in a unit to drive trucks. Commanders need to train soldiers of all MOSs to drive trucks and heavy transporters. Units need this kind of versatility to support movement of personnel, supplies and equipment.

### LEADER DEVELOPMENT

There were several leader development elements that worked and need to be sustained. Both the Non-commissioned Officer Education System (NCOES) and the Officer Education System (OES) are suc-

cessful programs that should be protected and maintained. The agility, initiative, and confidence demonstrated by leaders during Operation Desert Storm also validated the value of the CTCs as combat leader development opportunities.

Some leader development elements worked but still need improvement. RC leaders face the dilemma of pursuing collective training versus required individual training during their annual training period. Individual training and unit collective training tend to compete with each other, making cohesive combat teamwork difficult to attain.

Fratricide is an unfortunate reality of war, but improved risk-assessment training, leader awareness, and emphasis on C2 can reduce it. Post-Cold War leader training and assignments must stress operational versatility to meet the challenges of the future Army.

Some leader development items will require fixes based on Operation Desert Storm. Lessons learned indicate a strong need to improve RC attendance at NCOES courses. This will be a long-term fix but a vital one. Special operations forces (SOF) have incredible versatility and unique mix and match capabilities. All leaders need a better understanding of SOF capabilities and employment, including psychological operations and civil affairs. The CTCs and Battle Command Training Program can be important training vehicles to a better understanding of SOF.

At the end of the training and leader development presentation the

warfighters made the following comments.

The availability of resources to support training was a concern. Funds available to support training and base operations will continue to decline in the future. A balance will be required between sustaining quality training and maintaining existing systems with less money. There is a real danger in not being able to train as we fight. The training investment in multiple Basic Noncommissioned Officer Course sites was discussed because of the "out-of-hide" equipment and training toll on local units.

Publications need attention as resources decline, the force gets smaller, and more joint publications enter the system. The cost and number of publications are growing at a time of reduced resources, and we all need to look at what is really needed.

### Post-Cold War leader training and assignments must stress operational versatility to meet the challenges of the future Army.

There was agreement on the need to invest in the use of simulation for joint, combined, and theater-level training. Budget and environmental constraints will make the use of innovative simulation a requirement.

RC training tasks and standards must be evaluated to establish the start point for post-mobilization training and deployment criteria. The Army has made a clear statement to Congress on the training goal for the RC. The RC faces tough choices in pursuing both collective and individual task proficiency within a limited number of annual training days.

Discussion on this issue led to a related RC issue, that of how to get RC

soldiers to required individual training courses — especially NCOES — without taking key leaders away from annual training periods. The distributed training program was mentioned as a possible alternate for RC NCOES because it allows the leaders to attend with their units.

There are several measures being taken to improve the quantity and quality of language training: improved recruiting, changes in the quantity of students training in certain languages, and improved language capabilities in the RC received discussion.

The age and type of equipment available to USAR training divisions are issues, because there are major mismatches between the equipment in the reserves and equipment in the

active Army. These divisions need to train on the same equipment the Army expects to employ on the modern battlefield.

There may be a need for additional fieldcraft training in NCOES and

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**...the Army will maintain its focus on realistic and integrated training at all levels.**

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OES. Fieldcraft performance is high in advanced individual training (AIT)/one station unit training (OSUT), but leaders' ability to su-

pervise these tasks needs improvement.

Training and leader development will undergo some changes as the Army downsizes and adapts to future battlefield dynamics. However, the Army will maintain its focus on realistic and integrated training at all levels. Leaders will continue to be developed through a balanced progression of institutional training, operational assignments, and self-development. At the end of the conference the general consensus was that training and leader development were great success stories.





## DOCTRINE

Brigadier General Timothy J. Grogan, Assistant Deputy Chief of Staff for Concepts and Doctrine, Headquarters TRADOC, presented the briefing on Desert Storm doctrine lessons learned. He presented significant issues in the Base Operating Systems (BOS) of intelligence, maneuver, C2 mobility and survivability, fire support, air defense, and combat service support. He prefaced his presentation by stating that comments from the field commanders and information from emerging lessons learned studies, indicate that "doctrine worked." The conference warfighters reinforced this statement. Looking to the future and the post-Cold War era, portions of our doctrine need adjustment or development, based on new systems and new strategic requirements.

JSTARS capabilities and BDA were covered under intelligence doctrine.

*JSTARS and some of its related functions need to be 'tweaked' to take advantage of their full potential. JSTARS could not fully support the ground commander due to the limited number of aircraft and GSMs available. The mission priority must be established for targeting versus intelligence if the system can't handle the requirements of both.*

Increasing the number of GSMs in the theater would do many things. GSMs provided down to brigade level would put information in the hands of front-line commanders on fast moving, maneuver battlefields. Future GSMs will also provide live imagery. While the possibility may always exist for less than continuous JSTARS support of a corps area, any shortage critically affects targeting and intelligence functions within the corps.

BDA was the second issue covered under the intelligence BOS. BDA definition, analysis, and doctrinal responsibility were identified as *need-*

*ing to be fixed.*

Because assets used to determine BDA have other functions, BDA prioritization may not sufficiently satisfy maneuver commander requirements. Possibly the first issue that should be addressed is what procedures and equipment will be used to determine BDA. This issue may need resolution before doctrinal responsibility and priority are developed.

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There were no maneuver doctrinal shortcomings; *Airland Battle doctrine worked.* The changes and challenges of the post-Cold War era will be captured in the revised FM 100-5, Operations.

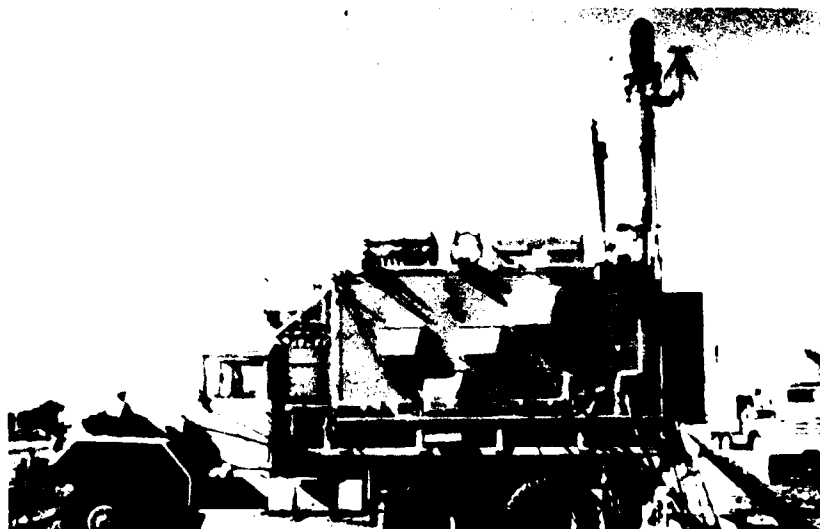
A review of the *Joint Command and Control doctrine revealed interoperability shortfalls* between the

Army and Marines. Air-space C2 was inadequate; ground operations and airspace control elements lacked a responsive communications link; and joint policy for communications procedures was lacking.

A working "quick-fire" channel, monitored by all services would help reduce airspace control problems. This joint "quick-fire" network would assist in passing information about MLRS and Army tactical missile system (ATACMS) fires to all services in the battle area. This is a major Air Force concern. Coordination versus control needs to be clearly determined on the issue of airspace C2.

Several issues were presented in the combined C2 area. One key item is the need for liaison team doctrine and guidelines for sharing intelligence with coalition partners.

Liaison teams clearly need to be robust, permanently manned, and sufficiently equipped. A proposal for organization of the liaison teams should be completed in the near future. The main issue is the doctrine and the personnel to fill these teams. General Franks stated that the personnel will come from TRADOC, will be dual-hatted, and will take part in training exercises to remain mission ready.



Discussions about C2 components at EAC centered on the *need to identify responsibilities* for the operational and tactical commanders in the theater. The briefing covered the three roles of the operational commander (theater army, component army, and numbered army) based on current doctrine and reflected the experiences of Operation Desert Storm.

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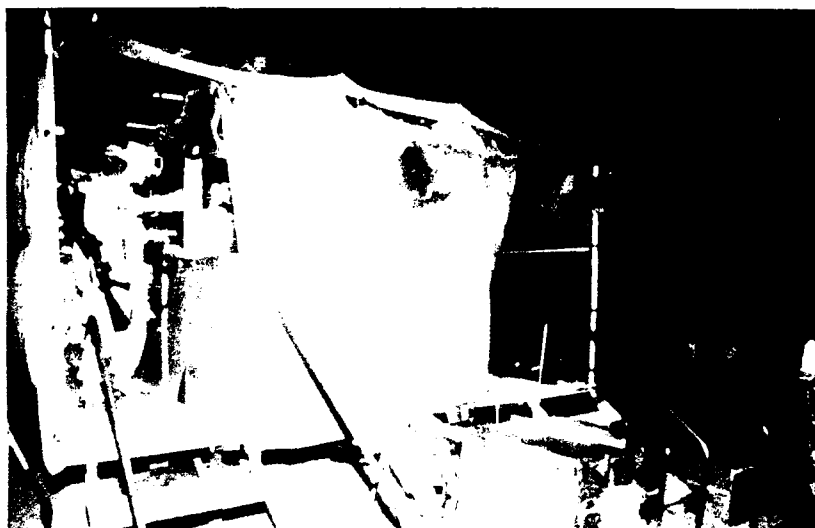
**Maneuver commanders must be able to get their priority increased when BDA is critical to their conduct of the battle.**

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Comments were made that the tactical commander's only theater responsibilities should be to fight and train; the Army component commander should be responsible for all other functions. C2 doctrine must address all contingencies and look closely at operations not involving the theater army, where the corps or division is the highest command in theater.

Handling of unexploded ordnance (UXO) by personnel not trained in explosive ordnance disposal was the only issue raised under mobility and survivability. Engineer personnel, with no special training in UXO disposal, were tasked to dispose of unexploded ordnance. *Doctrine needs to address responsibility and training for this critical task.* The technology of older munitions contributed to the dud rate problem. General Franks stated that this problem *needs to be fixed quickly.*

One comment was offered that the Army needs to take the lead in *fixing joint fire support doctrine.* The key to the fix is in joint doctrine concerning the definition of terms, targeting



issues, and the ability to adjust fire support coordination measures in rapidly changing tactical situations.

There is a need for a fire support element above the corps level. The joint force commander needs to designate a chairman of the Joint Targeting Board for the theater commander-in-chief (CINC). Doctrine must adopt near real-time targeting instead of the 48- to 72-hour cycle currently used. Simplicity and flexibility are the keys. Theater missile defense operations lack definitive joint doctrine for early warning or communication of warnings to tactical or operational units.

Combat service support (CSS) *issues that worked but should be 'improved'* were mobilization, deployment, redeployment, and demobilization (MDRD) and logistical C2 above the corps. MDRD involves many diverse issues such as IRR mobilization, RC equipment, home station operations, family support group planning and a myriad of other issues. Field Manual 100-17 addresses these issues and will be published in mid-1992.

Logistical C2 needs to be tailored to support different contingency operations in the post-Cold War Army. Current doctrine focuses on the Eu-

ropean theater implying multiple corps operations using fixed facilities. The field Army must clearly support combat operations with capability to direct logistics operations.

Port Support Activities (PSA), logistical reporting, and post conflict operations are CSS lessons learned, *requiring an Army fix.* PSA doctrine

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**The field army must clearly focus on the fight, and someone else must focus on logistics in future doctrine development.**

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must address world wide contingencies. Current doctrine addresses limited port operations with little guidance concerning structure and procedures. *The doctrine must be developed* to address these issues. The point was made to insure that doctrine covers more than just the deployment and redeployment phases. Logistical reporting discussions stressed a need to standardize reports across the theater, and doctrine writers and planners must be aware of the

distinct differences between logistical planning and reporting.

The Office of the Joint Chiefs of Staff, J7, is involved in the open issue of Joint Public Affairs doctrine and operations. The DOD and the warfighting CINCs should develop joint public affairs doctrine and refine forward deployed, theater public affairs operations. Public support was a direct contributor to the success of Operation Desert Storm, and sound public affairs doctrine is tied directly to public support.

*The void in post-conflict doctrine*

*is a significant issue.* Commanders pointed out that there is very little forethought or long-range planning for this mission. Post conflict humanitarian assistance was an unforeseen mission that required a significant commitment of combat units. Doctrine must address organizations and procedures. Two key points made during the discussions were:

1) we have a significant challenge that has never been addressed, that challenge being the organizations and expertise needed to destroy huge amounts of war materiel (munitions

and vehicles), and 2) we must be careful when writing the doctrine not to include political, legal, and humanitarian requirements we are unable to accomplish. The doctrine, if written well, will identify units that should be included in the planning and can accomplish those missions.

General Franks emphasized that we must write doctrine that is flexible enough to prepare for all levels of war and all types of missions around the world.



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## BATTLEFIELD DYNAMICS

The final portion of the Operation Desert Storm Conference was a presentation and discussion of new battlefield dynamics. The presentation was given by Major General Wesley K. Clark, Deputy Chief of Staff for Concepts, Doctrine, and Developments, Headquarters TRA-DOC. The presentation centered around two questions: what are the changing battlefield dynamics and what are the implications of these changes for doctrine? The process used to explore these questions was an examination of the Army's Airland Battle doctrine, the Airland Operations concept, and recent warfighting experiences. These formed the basis for discussions of the possible changes in dynamics resulting from new technology, the new strategic environment, and future Army missions.

A review of Airland Battle doctrine revealed a focus almost exclusively on warfighting. Airland Battle doctrine rested on the implicit assumption that if successful against a Soviet attack from Eastern Europe, we would be successful against any adversary. Therefore, key elements of the doctrine—the tenets of agility, initiative, depth and synchronization; the dynamics of combat power; and the battlefield framework of close-deep-rear—were universally applicable.

The Airland Operations concept began in 1987 as Airland Battle-Future. Originated to address a declining force density in Europe and an increasing regional orientation, this concept identified four, somewhat sequential, phases of battle and associated assumptions.

The first phase was the sensor/acquisition phase. It assumed that sensor technology would yield precise knowledge of enemy locations and provide a technological advantage over any adversary.

Phase two relied on increasingly

lethal, long-range firepower to shape the battlefield for the maneuver battle. With the ATACMS, AH-64 Apaches, and tactical air, we could attack deep with greater accuracy and enhanced effectiveness. Forces could actually be destroyed or seriously damaged by these deep fires.

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**Our recent experiences point to a new era in warfighting. To win decisively, we must win quickly but with minimal casualties.**

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The maneuver battle phase was seen as the decisive battle. Dispersed units would quickly come together; fight a short, tough, intense engagement against weakened enemy units, and then disperse. Attrition warfare had to be avoided.

As a result of this extremely intense fight with smaller forces, the recovery and reconstitution phase required greater emphasis. A new logistics doctrine emphasizing logistics C2 and a system to push supplies forward were required.

Recent experience has provided a report card for both our Airland Battle doctrine and the theory of Airland Operations. The doctrinal elements of combat power—maneuver, fire, force protection and leadership—were validated. We showed we could fight the deep-close-rear fights and even fight them simultaneously. We also learned that we need to put more emphasis on operations across the continuum, mobilization, and deployment. Beyond the doctrine, however, was the hint of something new in the idea of depth and how we view close, deep, and rear.

Many aspects of the emerging Airland Operations theory were also validated. Recognition in Airland Operations of the need for force projection, the necessity of joint and combined operations, and operations across the continuum, have been proven correct. But here also there seemed the glimmer of newly emerging battlefield dynamics not adequately addressed in the theory.

Our recent experiences point to a new era in warfighting. To win decisively, we must win quickly but with minimal casualties. The technology overmatch in the direct fire battle is absolutely critical. This was an unanticipated factor in the decisiveness of Operation Desert Storm.



We operated to apply overwhelming force in a joint environment, just as we said we would, and this principle was effective. We also recognized the possibility of attacking decisive targets simultaneously throughout the depth of enemy formations. Together, these insights suggest the need to revise our doctrinal treatment of battlefield dynamics at the strategic, operational, and tactical levels.

For purposes of advancing the discussion, TRADOC has grouped these emerging battle concepts into five baskets of thought: early entry lethality and survivability, depth and simultaneous attack, battlespace, command and control of the tempo of operations, and CSS. These groupings are tentative and open to further refinement, expansion or other modification, as are the concepts themselves.

In the first basket of thoughts, it was recognized that we must improve the survivability and lethality of the early entry force. Doctrinal issues include: force tailoring and versatility, special operations and light force packaging, functional lines of C2, and logistical support. These thoughts can build on much of what XVIII Airborne Corps has done in recent years, though these may be new to other elements of the Army.

The depth of the battlefield is also evolving. Modern capabilities afford the opportunity to strike simultaneously in-depth at enemy formations and assets in order to seize and retain the initiative, accelerate the destruction of enemy forces, and strike more deversity at operational level of center of gravity. With the evolution are a host of unresolved issues. These include: control and coordination of deep fires and interdiction, airspace C2, fighting with fires versus maneuver forces, when to commit and how to mass maneuver forces, and the exchange of information within a coalition. Both early entry

and battle depth involve strategic, operational, as well as tactical concerns.

In Operation Desert Storm we saw a continuation of the historic trend toward expanded Battlespace. Units "closed" at extended range. The greater lethal reach of our direct fire

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systems enabled us to begin decisive engagement with a distinct advantage. This expansion of battlespace also implies a decrease in concentration of forces, and with it a decreased vulnerability to area fire weapons. Once again we must think through the proper role of killing fires versus the closer assault, and in turn use these findings to drive our force designs, materiel requirements, and other functions.

We must also reconsider how to control the tempo of operations to gain decisive advantage. C2 on the move must be enhanced to enable us to control the tempo. This entails maneuver access to strategic intelligence products down to brigade level.

Divisions and brigades need imagery. Command vehicles and aircraft must access broadcast, processed, and/or raw data on the move. Similarly, divisions need tactical, non-line-of-sight communications technology.

These new dynamics require a versatile, tailorable, "beans and bullets overnight," logistics system perhaps based in CONUS or sanctuary not in theater of operations but overseas, or a combination. This system must address prepackaged and prepositioned equipment, storage afloat, and full in-transit visibility of supplies. Associated issues include: transferring traditional military support services to contracted services; commercial communications support; blurring the wholesale/retail logistics distinction, and the support role of the military services versus DOD agencies. These are clearly issues of strategic and operational significance.

Discussion of these evolving dynamics led to an emerging consensus of the continuing evolution of dynamics and reinforced the idea that FM 100-5 should be centered on warfighting. The implications of the Battlefield Dynamics presentation provided a useful focus for discussion. Forced entry issues, particularly lethality of the force and the relationship of lethality to controlling deployment assets, as well as requirements for ships and planes, were

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discussed. Access to satellite channels and national systems stood out as a critical issue and Army-Air Force coordination sparked much discussion. These discussions reinforced the urgency of addressing the changes in battlefield dynamics.

## NOTES

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