STATEMENT OF

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CONCERNING

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Mr. Chairman and members of the committee, I would like to express my appreciation for the opportunity to speak with you today. I welcome this chance to provide you with the Marine Corps' perspective on our experimentation efforts. During my testimony today I will review Marine Corps experimentation efforts over the last four years and describe how we will use the Marine Corps Warfighting Laboratory as the focal point to refine our future capabilities. As most of you are aware, our former Commandant, Gen. Charles C. Krulak, started our experimentation process by establishing the Warfighting Laboratory in October 1995. MCWL, as it is referred to, is located just down the road at Quantico, Virginia.

The Marine Corps started our experimentation process because we saw – and still see – an uncertain, unpredictable world. Threats are no longer clearly identified forces motivated by a defined ideology. Threats now range from terrorists to rogue states with large militaries to tribal and ethnic conflicts that threaten to spread across entire regions.

At the same time, the environments where conflicts are likely to occur have changed. The open battlefield we prepared for in response to the Soviet threat is the least likely type of warfare as we enter the 21st Century. Asymmetrical threats and other enemies educated by the television coverage of Desert Storm, Chechnya, Somalia and Kosovo will seek to limit our technological advantages and are unlikely to engage us on an open battlefield where we can bring all our weapons to bear. Instead, the sprawling urban areas of the world, with their sea of noncombatants and maze of streets and buildings, appear to be the most likely future battlefields.

Our great question when we started experimentation was how to take our current force and provide it with the versatility to complete a growing number of missions in any clime or place. How do we develop a force capable of defeating enemies in conventional wars and, at the

same time, agile enough to accomplish peacekeeping, humanitarian assistance, and other short-notice missions? What is the best way to build a force that can win battles in the desert, mountain, jungle, and the city streets?

At the same time, other great questions demand our attention. How do we sustain our forces in a world that will feature fewer and fewer overseas land bases and where a large build-up of supplies and equipment ashore may be impractical because of geographical, political or threat conditions? How do we develop fire support systems that protect our Marines and provide enhanced warfighting capabilities when they are miles from the ships that put them ashore? Clearly, our enduring partnership with the Navy is a vital part of how we address these unresolved issues in order to proceed on course with a unified strategic vision.

We believe we have developed a viable experimentation process to help us answer these questions. This has allowed us to enhance current capabilities while finding solutions to both near-term and long-term challenges.

Our major experimental projects – we have completed two of them and just started our third one – have provided numerous benefits and taught us how to experiment. During these efforts, we learned that several "good ideas" were, in fact, ***not so good***. At the same time, we made real progress in a number of promising areas such as the development of the Experimental Combat Operations Center that I will discuss later in my presentation.

In establishing experimentation, we first examined the post-cold war world and the possible characteristics of future conflicts. As mentioned before, our analysis indicated that the future would be marked by a variety of threats, ranging from terrorists with weapons of mass destruction to ethnic conflicts that threaten the security of entire regions.

Our first experimental project was Hunter Warrior. We examined how we could extend the influence and effectiveness of a standard Marine Expeditionary Unit (MEU) through training enhancements and advanced technologies. In short, we wanted to increase the MEU's combat power. A MEU has 2,000 Marines – and we believe that it is a lot of combat power -- but it does have limitations, especially when operating in the opening stages of a regional conflict.

Hunter Warrior took place at Camp Pendleton and at Twentynine Palms, California. It involved 12 days of force-on-force experimentation and featured an experimental force flown into the "playbox" at Twentynine Palms from Camp Pendleton. We did this to simulate the sea-based nature of the MEU so we could begin to examine vexing problems such as sea-based logistics, re-supply, and fire support.

Without going into laborious detail about "who shot John," as Marines like to say, I can tell you that Hunter Warrior provided several successes. First, we can in some circumstances dominate large coastal areas with modest forces. Second, we can employ a small number of Marine Air Ground Task Force units that have the potential to inflict severe losses and create circumstances that defeat heavier forces. And third, modest forces can substantially increase the odds in favor of successful joint force operations. These successes, though, were not merely the result of technologies such as the hand-held computers which allowed Marines to share information with MEU headquarters, but were the result of training, tactics, techniques, procedures and technologies combined.

Perhaps Hunter Warrior's greatest value lay in the fact that it taught us how to experiment. It also emphasized the requirement to fully integrate the results of our experiments into the Combat Development System. It was the Marine Corps first experiment since the 1930s

and was a difficult, sometimes painful, undertaking. Nevertheless, it was extremely worthwhile. We were able to learn from our mistakes and begin developing a viable experimentation process.

Urban Warrior was our second phase and examined the challenges posed by operations in cities and urban environments. We started this project because we see urban areas as the most likely battlefields in the early 21st Century. Most population forecasts estimate that by 2020, roughly 70 percent of the world's population will live in cities, and 70 percent of these cities will be within 300 miles of the coasts – the traditional operational areas of Marines and naval forces.

We believe many places in this "urban littoral" will contain all the classic ingredients for conflict. There will be overcrowding, tribal, ethnic and religious conflict, and competition for scarce resources.

Our final event of this project, and one you may have read about, was the Urban Warrior Advanced Warfighting Experiment. It took place at military installations in Monterey, California and at an abandoned naval hospital facility in Oakland, California.

We conducted the experiment at these sites because we had to test our tactics and technologies in realistic urban environments. The combat towns on our bases, while excellent for training small units in basic tactics, do not offer the complexity or the communications interference that cities do. The Oak Knoll facility, for instance, gave us enough space to operate a refugee center and conduct humanitarian operations. At the same time, it allowed us to patrol the streets on peacekeeping missions and engage in combat with an opposing force in a nine-story hospital.

The nine-story hospital was a unique opportunity for us and provided some of our best experimental data. The instrumentation system – a mixture of voice, data and global positioning location devices attached by velcro to ceilings in rooms, hallways and to the Marines' gear -- provided detailed information to our analysts and to the commander. The information included unit location and casualty status and was used for ground truth by experiment control. The Joint Combat and Tactical Simulation (JCATS) – a joint system capable of simulating friendly and enemy forces – was also used during the experiment. We combined JCATS information with real-time information to support the common tactical picture (CTP). All CTP information was recorded and used for subsequent playback and analysis.

The playback allowed participants and commanders to review the experiment to see what happened and why. It also provided the analysts with the ability to create a detailed reconstruction of which factors contributed to success and which caused problems.

Our attacking units in the hospital – the experimental force – took 30 to 70 percent casualties. The opposing force, composed of Marine reservists from the Bay Area, suffered casualty rates as high as 90 percent.

There were some mitigating factors involved in these numbers, but the bottom line is that the casualty rate was too high. One of our priorities over the next year is to figure out how to lower it. Project Metropolis – a follow on project to Urban Warrior – will examine urban tactics at the platoon and squad level. We believe, after reviewing the data from the experiment, that we can significantly lower the casualty rate in the urban environment.

As might be expected, experimentation has evolved over the past four years. Hunter Warrior and Urban Warrior have laid the procedural groundwork for the conduct of experiments.

MCWL's first process was a linear framework that developed and approved experimental objectives and solutions. It then conducted planning and coordination with other commands and agencies. This coordination was followed by a wargaming and simulation phase. The Lab made adjustments then conducted field experimentation. MCWL then formally analyzed the results and forwarded them to the Commandant of the Marine Corps. This process focused narrowly on specific functions and, although the process called for a wargaming and simulation step, time and resource constraints precluded this from occurring. In hindsight, we recognized this as a problem and have since corrected it. Equally important, we learned that we must properly resource, analyze and assess each step of the process.

Our current experimental process starts with the concepts forwarded by the naval services. The Chief of Naval Operations and the Commandant of the Marine Corps captured the naval services' future vision in the white paper titled *Forward…From the Sea.* The naval services derived this vision from the National Security Strategy, the National Military Strategy and the Defense Planning Guidance. This vision, along with Joint Vision 2010, focused on the refinement of operational concepts and eventually led to the Marine Corps future conceptual doctrine *Operational Maneuver from the Sea,* usually referred to simply as OMFTS.

OMFTS is the Marine Corps capstone concept and reveals new ways of thinking about our primary mission, littoral power projection. It is applicable across the complete range of operations we call *the three-block war*. We see our 21st Century Marines having a high likelihood of conducting peacekeeping and humanitarian assistance operations and intense combat operations, all in a relatively short period of time and in the same geographical area.

These documents provide the conceptual basis for our experimentation process. Much of Urban Warrior was linked to the OMFTS concept and Capable Warrior's purpose is to overcome the inherent challenges in the concept.

Our experimentation process proceeds from concept refinement, to capability development and then experimentation. We begin with an examination of the overarching concept, OMFTS, and address the required capability improvements. We then develop solutions as experimental concepts of operation. These concepts of operation are wargamed to help us to envision the tactics, techniques, procedures and technology enablers that may be necessary to make OMFTS a reality. We next refine the results of war games and simulations through analysis and assessment. The results are then used in capability development, our next step.

Capability development looks at possible combinations of organization and equipment. During this step, we conduct technical assessments and tactical experiments to determine which of these combinations warrant further consideration.

Multiple actions take place during this step. These actions include the search for appropriate organizational, tactical and training changes and technology enablers to support the required capabilities. We then integrate the things that work into the final step of the process. Part of this process is continuous analysis of our efforts. This drives a synthesis of our experience that we compile into a series of bite-sized, easy-to-read reports to Marines and Sailors in the Operating Forces. We call these pocket-sized booklets ***X-Files***. In addition to providing information to our Marines, the X-Files often generate bottom-up ideas that help us refine our efforts. We have made these X-Files available on our Warfighting Lab's web site to ensure the greatest number of Marines have access to our lessons learned. As a side note, we have

discovered that not just Marines are interested in this information, but our sister services and civil authorities have contacted us requesting this information.

Finally, we experiment with these developed capabilities in operational venues called Advanced Warfighting Experiments. These experiments ensure we fully examine organization, tactics, techniques, procedures and technologies.

Following the experiments, we conduct an analysis and assessment on the developmental capabilities. Things that worked enter the concept based requirements process and those that need improvement re-enter the experimentation process. We discard those things that show no conceptual promise.

From the start, our experimental efforts have included sister services and several coalition partners. Every experiment to date has involved observers and participants from sister services as well as Coalition partners.

The Marine Corps also participates in two Advanced Concept Technology Demonstrations (ACTDs). The Military Operations in Urban Terrain ACTD is a joint Army-Marine Corps project and two joint experiments – one at Camp Lejeune and one at Ft. Benning – have been held as part of this effort. The Marine Corps Warfighting Lab and the Navy's Maritime Battle Center are working together in our second ACTD, Extending the Littoral Battlespace. This effort has us conducting our experimentation in concert with the Navy's Fleet Battle Experiments to ensure both branches are synchronizing efforts.

Our Coalition partners have maintained an active interest in our efforts and liaison officers from the United Kingdom and Australia are members of the MCWL staff. Royal Marine

and Royal Dutch Marine units participated in Urban Warrior events, providing their expertise and experience in urban operations.

We also participated in experimentation with the Office of the Secretary of Defense on the All Service Combat Identification and Evaluation Team's annual experiments. In addition, MCWL's experimental command element, the Special Purpose Marine Air Ground Task Force (Experimental), used their new command and control systems last year while participating with the US Army at their Joint Readiness Training Center.

During our most recent experiment, we were augmented by staff from the Joint Advanced Warfighting Program and the Joint Forces Command. These augments were a great addition. Their assistance was not limited to us learning from them, but their intent was to learn as much as possible from us on how to conduct experimentation and ensure that they did not make the same mistakes we did. This will pay dividends in future experimentation, especially as it relates to the concept of attack operations against critical mobile targets, because we see joint warfighting as the way to do business and the concepts within joint experimentation as fitting very cleanly into Marine Corps concepts for future fighting.

Currently, we are working with the Joint Forces Command in planning "Millennium Challenge," a multi-service event scheduled for September 2000. This effort is the initial step toward the first Major Joint Integrating Experiment (MJIE), scheduled for 2004.

We feel joint experimentation is crucial to both the Marine Corps and our sister services. In future conflicts, naval forces will participate in a wide range of operations with other services. We need to continue to build on the emerging concepts contained in Joint Vision 2010 – the blueprint for future joint operations – to maintain a viable force. We will also be conducting

operations with coalition partners and planning is currently underway for Coalition Warrior, an experimental project focusing on coalition issues. The project is currently scheduled for 2002-2003.

To experiment as a joint force we must have a planned schedule of joint experimentation. It is not enough that we integrate the systems of each service. One of our objectives in joint experimentation is ensuring soldiers, sailors, airmen, and Marines understand how to synchronize systems and capabilities in support of a joint force commander and the joint campaign.

Opportunities for joint experimentation are plentiful. It may be possible for major joint exercises to have an experimentation phase and an operational phase. The Marine Corps conducted its Urban Warrior Advanced Warfighting Experiment – and the Navy conducted its Fleet Battle Experiment – in conjunction with Kernel Blitz '99, a major Navy-Marine Corps training exercise.

Combining experiments with planned operations is important because it minimizes the impact on operational tempo. In addition, operating forces are the best judges of what works and does not work. Their input is crucial for successful experimentation.

Experimentation with our joint and coalition partners has also provided immediate enhancements to our modernization programs. These programs not only include new technologies, but improvements in tactics, techniques and procedures.

In essence, experimentation is a modernization program. It attempts to develop solutions quicker than our normal systems development and acquisition process. There are numerous examples of experimentation providing a direct benefit to operating forces.

One example is the need for precision targeting devices. In Hunter Warrior, the small, dispersed squads employed the Forward Observer/Forward Air Controller (FOFAC) target acquisition system. This system combined binoculars, a laser range finder, and a GPS into a single device. It enabled the Marine teams to accurately locate targets and then digitally transmit that target information to an artillery unit or aircraft. Consequently, the time normally required to locate, identify and subsequently prosecute a target was reduced from minutes to seconds.

FOFAC, now known as the Precision Targeting System (PTS)**,** has been continually refined to improve its targeting capability. It is now being evaluated by our Combat Development System for procurement and subsequent fielding to the operating forces. During the interim, we have provided the 11th Marines, an artillery regiment in Camp Pendleton, California, two versions for operational evaluation. We are receiving positive feedback on the use of the systems.

We also employed the Unmanned Aerial Vehicle (UAV) Dragon Drone throughout Hunter Warrior. Its primary purpose was to provide a day/night reconnaissance, surveillance and target acquisition (RSTA) capability. Capable of providing a view of the operating area and acquiring targets beyond visual range, it permitted the friendly force to engage the enemy force with long range precision fires. An unforeseen result was that Dragon Drone also had a psychological impact on the battlefield. After being targeted on several occasions by the UAV, we found it was not necessary to directly fire upon the enemy to influence their maneuver. The

opposing force realized the UAV was targeting them and were forced to move on several occasions to avoid being fired on.

Experimental Unmanned Aerial Vehicle (UAV) technology has also progressed since its first employment during Hunter Warrior. As a direct result of the Dragon Drone's success in that experiment, we have made significant improvements to the system. Over the past three years, the Dragon Drone UAV has deployed with the 15th Marine Expeditionary Unit to the Persian Gulf and is now currently deployed with Second Marine Expeditionary Force's UNITAS contingent in South America.

MCWL is also in the process of building a follow-on UAV, Dragon Warrior. The Dragon Warrior concept is a direct result of lessons learned from Urban Warrior that indicated the need for an unmanned platform capable of operating on both open and urban battlefields. The Dragon Warrior features both shrouded rotor technology and removable wings that makes it a highly capable platform for operations in the urban environment. The prototypes are due to begin flight testing in March 2000. Eventually, the Warfighting Lab will receive two prototypes and four Ground Control Stations in September 2000.

Among the most promising experimental initiatives in Hunter Warrior was the common tactical picture. The Common Tactical Picture provides a visual look at all known enemy and friendly forces on the battlefield and is built with information and intelligence provided by national and joint assets and from troops on the ground. Easy-to-understand graphic displays were used to show complex battlespace information. This capability was fielded down to the platoon level and greatly aided commanders and their staffs in rapidly assessing changes on the

battlespace in real time and enhanced the command's situation awareness. The result was better and more effective decisions.

One training method that has coupled technology and tactics is the *Combat Squad Leader's Course*. As initially conceived, the Combat Squad Leader's Course had several components:

- A tactical decision making syllabus to improve a small-unit leader's critical thinking and risk assessment ability
- A follow-on simulation based decision making range to train these leaders in situational decision making
- A series of squad problems designed to be conducted at the tactical unit level for use by the squad leader in training his squad

To push tactical decision making to the lowest level for Urban Warrior, we conducted extensive training with Marines from the First Marine Expeditionary Force in Camp Pendleton, California, using the Combat Squad Leader's Course (CSLC). Combat scenarios typically last 30-40 minutes and Marines have been unanimous in their praise of the system. To quote one young Marine corporal,

> *"Sir, I don't know whose idea this was or what it took to put it together, all I can say is that this is the best training I've had short of being in combat since I've been in the Marine Corps."*

The course, which includes its own X-File - *Combat Squad Leader Decision Making* - is an example of a simple solution that has improved our Marine small-unit leader's capability to make sound tactical decisions.

A second facet of tactical operations at the small unit level is being able to communicate. During Urban Warrior, the same Marine rifle squad Non-Commissioned Officers that completed the Combat Squad Leader's Course were equipped with *Intra-Squad Radios* (ISR).

The Intra-Squad Radio was a small, hand-held, Commercial Off-The-Shelf (COTS) radio. Currently, the lowest echelon of command possessing a reliable tactical radio is the Marine platoon commander. In Urban Warrior, an integrated radio network using the commercial radios was available to not only the platoon commander but also his squad and fireteam leaders. This integrated network not only allowed each fireteam leader to communicate within his platoon, but also allowed communications with other tactical units in the same operating area. What is important here is not the technology itself, which we should not understate, but the capability that this technology produces by allowing us to conduct a downward shift in tactical decision making.

Because the significant combat power of the Marine Corps comes from our Air-Ground team, we had to find a way to ensure that our experiments considered this. Due to the restrictions of conducting an experiment close to a large metropolitan area, however, the traditional employment of Marine aviation in support of ground maneuver forces was limited during Urban Warrior events in Oakland and Monterey, California. During the months preceding Urban Warrior, we conducted research on the urban aviation support question with the Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) in Yuma, Arizona.

The study indicated that neither the Marine Corps nor anyone in the Department of Defense had a suitable urban range for training aviators for urban close air support missions. In response, the Marine Corps Warfighting Lab and MAWTS-1 commissioned the construction of an *Urban Close Air Support (CAS) Facility* at Marine Corps Air Station Yuma. The complex has 167 buildings constructed from shipping containers and empty cluster bomb unit containers. It covers a 400-meter by 350-meter area and has buildings ranging in size from one to five stories of various shapes. It also contains 28 vehicle targets and simulated personnel. In addition to very accurate weapons impact scoring instrumentation, the range has a no-drop bomb scoring system and a weapons effect analysis system. The no drop scoring system gives us the ability to call and adjust urban close air support while actually occupying structures within the target area. In addition, the impact scoring system gives us reliable results of target-weapon matches and immediate feedback on precision ordnance effectiveness. Beyond this, all of these activities can be displayed on a 3D screen to assist us in experiments, training or operational planning and rehearsal.

In June 1999, as a continuation of the Urban Warrior experiment held in California, the Warfighting Lab conducted an aviation experiment to assess urban aviation operations.

The aviation experiment evaluated the employment of precision guided munitions and laser and optically guided missiles. It also examined the ability of unmanned aerial vehicles to provide real-time reconnaissance information and targeting data. We found that the term "precision guided munition" and subsequent employment of these assets in an urban environment can be misleading. For urban combat, precision guided munitions have to be extremely accurate and their effects must be scalable.

During the experiment we tried to put a laser-guided munition through a window. We successfully laser-designated a window but the problem is that the accuracy of some precision weapons is not precise enough for the urban environment. The munition used – it had a median 11-meter Circular Error Probability (CEP) – and operated consistent with its parameters but still missed the building.

We also employed inert Tube-Launched, Optically Tracked, Wire-Command Link Guided (TOW) missiles from helicopters in the same experiment. Although our initial impression was that this particular method would be less accurate than the laser guided munition, we found the opposite to be true.

The last four years have been difficult but productive. Experimentation has yielded almost immediate benefits to the Marine Corps. Dragon Warrior and the Precision Targeting System, both mentioned earlier, are two successes. There are also several others.

The first was the organization of the Chemical-Biological Incident Response Force (CBIRF) – established to meet the threat posed by weapons of mass destruction. It started as a MCWL initiative and quickly became an operating unit. Located at Camp Lejeune, N.C., CBIRF first deployed to provide a contingency force and has received numerous subsequent deployment taskings from the National Military Command Authority.

Non-lethal weapon development was another success. Marines realized – and it was reinforced by our experiences in Somalia – that there must be an option between deadly force and verbal warnings in complicated peacekeeping missions. One of MCWL's first experiments, conducted in June-July 1996, examined non-lethal weapons and the tactics for their employment.

The result was a non-lethal weapon capability set that we quickly fielded to our Marine Expeditionary Forces.

During Hunter Warrior, the Fast Attack Vehicle (FAV) was identified as a requirement by the operating forces. They needed a vehicle that could move in rough terrain that possessed sufficient room to carry supplies, and more importantly, could carry on-board weapons systems. Through further operational experimentation during Urban Warrior and in the Fleet Marine Force, several changes took place improving the Fast Attack Vehicle's capabilities. As a result, the Marine Corps has procured 62 interim vehicles to be delivered during November 1999.

Another success was the Ground Observation Special Support Intelligence Program (GOSSIP). This system is a modified version of Orion Scientific's GangNet urban group analysis software. It provides secure rapid access to and analysis of the data that is routinely collected, analyzed and reported during the reconnaissance of insurgent organizations. This tool proved to be extremely valuable in the Urban Warrior experiment and is in the process of being provided to the 24th MEU for use in its impending real-world deployment. Furthermore, the 1st Intelligence Battalion is procuring a GOSSIP system for use by its team assigned to the UN mission in East Timor.

The Combat Squad Leaders Course has also matured considerably since its employment in training Marines for actions during Hunter Warrior. Now called the Combat Decision Range, this system has undergone extensive changes to provide more realistic combat scenarios. The system has undergone rigorous evaluation by the First Marine Expeditionary Force in California with continued evaluation scheduled with the Third Marine Expeditionary Force on Okinawa.

The Experimental Combat Operations Center (ECOC) is another success. It was developed in conjunction with the Extending the Littoral Battlespace ACTD and Commander, Third Fleet. The results of this combined effort led to the permanent installation of an ECOC aboard the USS Coronado that we will continue to use during future naval expeditionary force command and control experiments, demonstrations and exercises. An ECOC has also been constructed at MCWL in Quantico for both Special Purpose Marine Air Ground Task Force training and local experimentation.

The Integrated Marine Multi-Agent Command and Control System (IMMACCS) is a related success story**.** IMMACCS is a revolutionary command and control system that uses an object-oriented approach to represent the battlespace in a visual manner. In this manner, we can define the battlespace environment not only in terms of characteristics, but also in terms of relationships and behaviors. This information representation can accurately reflect status conditions and interactions, thereby enabling realistic decision support to the commander and his staff. MCWL is currently working with the Maritime Battle Center to expand the IMMACCS to include naval expeditionary fires. We are also examining the U.S. Army's Common Message Processor in preparation for using IMMACCS in the Joint Forces Command's Millennium Challenge experiment.

In addition to these successes, we have also constructed an Urban Close Air Support Facility that is used for ongoing urban aviation training. It is invaluable for its unique opportunity to assess experimental aviation fire support systems and munitions.

Some of our efforts, however, are "stand alone" projects that are not a direct result of experimentation. An example is the Night Integrated Training Environment Lab, currently under

construction at Marine Corps Base Quantico, Virginia. The design of this facility is to support Marine infantry night vision device training as well as providing a facility that simulates realistic night fighting scenarios. The 125 foot long by 80 foot wide building, divided into 3 lanes, each presenting a different fighting environment, will allow Marine fire-teams to navigate through a jungle, desert, woodland and urban environment. This practical application will teach Marines to overcome the limitations of night vision devices, an essential skill in light of future warfighting requirements. The NITE Lab will also be used for night device experimentation.

Not all of our experiments have resulted in success. The most visual failure happened during Hunter Warrior with the near escape of our aerostat, a blimp designed to carry communications relay equipment and act as a low-level satellite that would let us bounce signals from point to point over the battlespace. At the end of the experiment, the aerostat came very close to slipping its tether. Only the combined efforts of the experiment director and a squad of Marines – who finally wrestled the blimp to ground after a rambling mile-long chase across the rocks and cactus of the desert floor – kept it from floating away over the expanses of the Mojave.

As you all know, experimentation has a cost. The Marine Corps is the smallest of the armed services and we do not have the wherewithal to establish special units to conduct experiments. Our operating forces on both coasts have provided the Marines and units to carry out our experiments. While these efforts place unusual operational burdens on commands, I want to stress that it does not reduce readiness. During our recently completed Urban Warrior Advanced Warfighting Experiment, for example, Marine after Marine told us that the experiments were the best urban training they had ever received. And, in his *Commandant's Guidance*, our 32nd Commandant, General Jones stated that *our Marine Air Ground Task Forces are ideal for evaluating emerging joint doctrine, force structure, training methods, or equipment*

in an environment that is a microcosm of the joint operational context. Our rich history of innovation offers much in this regard, and we should seek opportunities to use the Marine Corps as the Defense Department's premier conceptual "test bed."

The Marine Corps Combat Development Command and the Marine Corps Systems Command are working to bridge the gap from experimentation to operational capability. The goal is to rapidly transition our Lab's experimentation successes to the operating forces by exploiting leading-edge commercial technologies as soon as they appear. The Planning, Programming and Budgeting System has served the Department of Defense well over the years. However, with the rapid advances in technology, we need to ensure that we are able to respond when opportunity knocks. The reality is the PPBS cycle cannot keep pace with advances in commercial technology.

We must take advantage of every opportunity provided by technology to keep pace with or counter threats quickly. In the past, we had to use funds from experimentation to exploit the results of experimentation. A "robbing Peter to pay Paul" situation. Now, the Marine Corps has established a funding line to allow us to respond to emerging opportunities. This initial effort has been small, but it has allowed us to provide our operating forces with new thermal weapon sights, improved target designators, and squad radios. This Accelerated Acquisition Process complements the Combat Development System by providing a means to get at least an adequate functional capability to our operating forces in a more timely manner. Follow on action through the normal PPBS cycle would complete distribution Corps-wide.

MCCDC is working within the PPBS to improve responsiveness to new opportunities. This year Congress has given us funding to create a Center for Non-traditional Operational

Studies (CNTOS) to bring together world class experts to examine responses to emerging threats and opportunities. Study areas will include cultural intelligence, lessons learned from non-traditional operations, psychological operations, non-lethal weapons policy and methods we can take to counter the chemical-biological terrorism threat.

Maintaining readiness and relevance in a rapidly changing world are goals we must achieve. Industry and the Department of Defense are currently exploring many initiatives with potential military applications. Organizing, equipping and training our Marines to meet future challenges requires us to continue experimentation that provides innovative solutions and timely exploitation of technology.

We need your continued support to provide our Marines with the combat power and operational versatility required for the 21st century. Together with industry, we can capitalize on these initiatives and stay abreast of change.

Again, I would like to thank you for the opportunity to express my views, and I look forward to your questions.