



NATIONAL TRAINING AND SIMULATION ASSOCIATION

## **Air Force**

# *Training 2015*

RELEASED IN NOVEMBER 2010

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## Acknowledgements

Once again, NTSA is proud to have sponsored an effort which has resulted in a comprehensive assessment of future needs in the training and simulation markets. This year's effort was especially difficult because of the increased security and extensive budget changes.

The effort required many hours of hard work and dedication. I personally commend the NTSA members, government organizations, and commercial companies who contributed to the success of this venture.

I extend special thanks to Dr. Linda Brent, of The ASTA Group, LLC, who chaired the *NTSA Training 2015*. We could not have completed this high quality product without her leadership and organizational skills.

*Air Force Training 2015* presents information to assist industry's support of the U.S. Air Force current and future training needs. This volume reports information gathered through interviews with AIR FORCE major commands and agencies regarding their training requirements for the next five years. Additional information was obtained through publicly available government documents, and other source material obtained through Internet research.

The Air Force Committee conducted customer interviews, research, and authored the market survey report. The Air Force Committee members are listed below:

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- Glenn Moses, Flight Safety International

It is with much gratitude that I thank the government individuals and organizations, who participated in the *NTSA Training 2015*. Once again, those responsible for developing requirements, and acquiring and using training and simulation systems and products were most forthcoming with their perspectives.

*RADM Fred Lewis (U.S. Navy Ret.), President*

*National Training Systems Association*

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# AIR FORCE Training 2015

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*“The mission of the United States Air Force is to fly, fight and win...in air, space and cyberspace. To achieve that mission, the Air Force has a vision: The United States Air Force will be a trusted and reliable joint partner with our sister services known for integrity in all of our activities, including supporting the joint mission first and foremost. We will provide compelling air, space, and cyber capabilities for use by the combatant commanders. We will excel as stewards of all Air Force resources in service to the American people, while providing precise and reliable Global Vigilance, Reach and Power for the nation.”*

Source: <http://www.af.mil/main/welcome.asp>

## 1.0 Introduction

The Air Force views developing professional Airmen as the heart of its capability to perform missions. Equipping its servicemen and women with advanced technological capabilities to pursue objectives, and applying them in unison in combat are also core among its competencies. Integrated military systems and innovative operational concepts maximize Air Force combat capabilities. These “core competencies form the foundation upon which the Air Force organizes, trains and equips, and form the cornerstones of the service's strength as a military service” (Secretary of the Air Force Dr. James G. Roche, as in Elliot, 2010). [http://www.capflyer.com/capflyer\\_archives/stories/012303/51-1.shtml](http://www.capflyer.com/capflyer_archives/stories/012303/51-1.shtml). These core competencies enable six distinct Air Force capabilities:

1. Air and Space Superiority
2. Global Attack
3. Global Mobility
4. Precision Engagement
5. Information Superiority
6. Agile Combat Support

Source: <http://www.af.mil/main/welcome.asp>

## 1.1 Air Force Organization Overview

The Department of the Air Force incorporates all elements of the Air Force. It is administered by a civilian secretary appointed by the President of the United States and supervised by a military chief of staff. The Secretariat and Air Staff help the secretary and the chief of staff direct the Air Force mission.

To assure unit preparedness and overall effectiveness, the secretary is responsible for and has the authority to conduct all affairs of the Department. This includes training, operations,

administration, logistical support and maintenance, and welfare of personnel. The secretary's responsibilities include research and development.

### **1.1.1 The Air Staff**

The Air Force Chief of Staff presides over the Air Staff, transmits Air Staff plans and recommendations to the secretary of the Air Force and acts as the secretary's agent in carrying them out. The chief is responsible for the efficiency of the Air Force and the preparation of its forces for military operations.

Other members of the Air Staff are:

- Chief of Staff
- Assistant Vice chief of Staff
- Chief Master Sergeant of the Air Force
- Deputy Chief of Staff for Manpower and Personnel
- Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance
- Deputy Chief of Staff for Operations, Plans and Requirements
- Deputy Chief of Staff for Logistics, Installations and Mission Support
- Deputy Chief of Staff for Strategic Plans and Programs
- Assistant Chief of Staff for Strategic Deterrence and Nuclear Integration
- Chief of Safety
- Director of Analyses, Assessments and Lessons Learned
- Judge Advocate General
- Director of Test and Evaluation
- Surgeon General
- Air Force Historian
- Chief Scientist
- Chief of the Air Force Reserve
- Chief of the National Guard Bureau
- Chief of Chaplain Service

### **1.1.2 Major Commands**

The ten major commands, field operating agencies, direct reporting units and their subordinate elements constitute the field organization that carries out the Air Force mission. There are two Reserve components, the Air Force Reserve, which is one of the ten major commands, and the Air National Guard. The ten major commands are:

1. Air Combat Command, Langley Air Force Base (AFB), Virginia
2. Air Education and Training Command, Randolph AFB, Texas
3. Air Force Global Strike Command, Barksdale AFB, Louisiana
4. Air Force Materiel Command, Wright-Patterson AFB, Ohio
5. Air Force Reserve Command, Robins AFB, Georgia
6. Air Force Space Command, Peterson AFB, Colorado
7. Air Force Special Operations Command, Hurlburt Field, Florida
8. Air Mobility Command, Scott AFB, Illinois

9. Pacific Air Forces, Hickam AFB, Hawaii
10. U. S. Air Forces in Europe, Ramstein Air Base (AB), Germany

Major commands are organized on a functional basis in the United States and a geographic basis overseas. They accomplish designated phases of Air Force worldwide activities. Also, they organize, administer, equip and train their subordinate elements for the accomplishment of assigned missions. Major commands generally are assigned specific responsibilities based on functions. Elements of major commands include numbered air forces, wings, groups, squadrons and flights (listed in descending order of command).

The basic unit for generating and employing combat capability is the wing, which has always been the Air Force's prime war-fighting instrument. Composite wings operate more than one kind of aircraft, and may be configured as self-contained units designated for quick air intervention anywhere in the world. Other wings continue to operate a single aircraft type ready to join air campaigns anywhere they are needed. Air base and specialized mission wings such as training, intelligence and test also support the Air Force mission. The cornerstones of the Air Force lie within the wing, operations, logistics, and support groups.

### **1.1.3 Other Field Organizations**

Field operating agencies and direct reporting units are other Air Force subdivisions and report directly to Headquarters (HQ) Air Force. Each of these organizations is assigned a specialized mission restricted in scope compared to the mission of a major command. Field operating agencies carry out field activities under the operational control of a HQ Air Force functional manager. Direct reporting units are not under the operational control of a HQ Air Force functional manager because of a unique mission, legal requirements or other factors.

## **1.2 Air Force Organizations Responsible for Education and Training**

While each major command of the Air Force also has mission responsibilities that include recurrent training, the primary mission of the Air Education and Training Command (AETC) is training service members. AETC's vision is to deliver air, space, and cyberspace education and training. The organization includes the Air University and the 2nd and 19th Air Force. AETC serves as the executive agent for all Air Force sponsored international training and education and implements and approves Air Force sponsored security assistance training (U.S. Air Force, 2009; <http://www.af.mil/information/factsheets/factsheet.asp?id=138>).

Each year, AETC members train or facilitate training for more than 4,400 students from more than 130 countries (U.S. Air Force, 2009).

As part of the AETC, the 2nd Air Force provides basic, non-flying, technical and expeditionary training.

- Basic Training – includes basic war skills, military discipline, physical fitness, drill and ceremonies, Air Force core values and a comprehensive range of subjects relating to Air Force life taught by instructors.

- Technical Training – instructors conduct technical training in specialties such as aircraft maintenance, civil engineering, medical services, computer systems, security forces, air traffic control, personnel, intelligence, fire fighting, and space and missile operations
- Specialized training – for military working dogs and dog handlers at Lackland AFB for the Department of Defense and the Transportation Security Administration. Additionally, the Inter-American Air Forces Academy at Lackland AFB hosts more than 160 courses in aviation specialties, taught in Spanish, to students from 19 Western hemisphere countries.

The 19th Air Force conducts AETC's flying training and cadet airmanship programs at the United States Air Force Academy for more than 2,500 cadets per year. It is responsible for training aircrews and air battle managers. Training includes:

- Pilot Training – either Euro-NATO Joint Jet Pilot Training or ENJJPT
- Combat Systems Officer (CSO) training – combines portions of navigator and electronic warfare training to produce an aviator skilled in advanced navigation systems, electronic warfare and weapons employment.
- Enlisted Flying Training – aircrew specialties including flight engineers, air-to-air refueling boom operators, loadmasters, aerial gunners, airborne communications specialists and weapons directors.
- AETC's Survival, Evasion, Resistance and Escape (SERE) Training.

The AETC Air University conducts professional military education (PME), graduate education and professional continuing education for officers, enlisted members and civilians throughout their careers. Wilford Hall Medical Center at Lackland AFB and Keesler Medical Center at Keesler AFB provide most of the Air Force's graduate medical and dental education, as well as enlisted medical training. Source: U.S. Air Force, 2009;

<http://www.af.mil/information/factsheets/factsheet.asp?id=138>

AETC also created a new directorate to strengthen the focus on training for the Air Force's nuclear enterprise. This effort utilizing training, professional military education and career development to enhance nuclear-related expertise and ensure positions throughout the enterprise reflect a proper match-up of requirements and assignments. The new office, AETC Nuclear Operations, Plans and Programs, is on a mission to re-establish a culture of accountability and rigorous self-assessment to ensure the highest standards of nuclear excellence (<http://www.saffm.hq.af.mil/shared/media/document/AFD-100129-082.pdf>).

## 2.0 Market Description

Analysis published by *Frost & Sullivan* (<http://www.aerospace.frost.com>), *U.S. Military Training and Simulation Market*, projects that DoD expenditures on training and simulation products and services will reach \$24.1 billion by 2015. The Air Force is one of three top DoD spenders on training products and services—a market which will likely grow through FY2015. Growth will be driven by “high costs in live training, expanding simulation capabilities, and the desire to decrease wear and tear on operational assets.” Training device focus is anticipated to shift from

flight simulators, long relied on for training in the Air Force, to virtual and constructive training (Frost & Sullivan, 2010).

Notable market growth will also take place in Unmanned Aerial Systems (UAS). A June 12, 2010 Memorandum of Agreement (MOA) signed by the Chief of Naval Operations and Air Force Chief of Staff establishes a U.S. Navy and U.S. Air Force mutual partnership in defense aviation surveillance, focused on increasing interoperability of multi-mission aircraft (Market Research Media, 2010).

### 2.1.1 Market Value (Budget)

The FY 2011 Air Force baseline budget totals \$119.6 billion. An additional \$20.8 billion was requested for overseas contingency operations, or OCO, to support ongoing operations in Afghanistan and Iraq.

**Table 2-1: Individual Training by Category by Service (\$M)**

	FY 2009 Actual	Price Change	Program Change	FY 2010 Estimate	Price Change	Program Change	FY 2011 Estimate
Recruit Training	13.0	0.2	6.3	19.5	0.3	8.4	28.2
Specialized Skill Training	413.5	7.9	-0.1	421.3	7.9	80.9	510.1
Professional Development	207.4	3.8	-4.2	207.0	3.6	1.0	221.6
Officer Acquisition	80.7	2.2	34.9	117.8	2.3	-5.7	114.4
Flight Training	775.8	46.5	33.7	856.0	74.6	82.2	1012.8
Training Support	124.6	2.9	-9.3	118.2	2.5	6.1	126.8
Senior ROTC	88.9	1.1	-7.7	82.3	1.2	7.0	90.5
Installation Support/FSRM	1264.8	21.3	-292.3	993.8	18.5	301.6	1313.9
Total	2968.7	85.9	-238.7	2815.9	110.9	491.5	3418.3

Source: Fiscal Year (FY) 2011 Budget Estimates, February 2010. Operation and Maintenance, Air Force, p. 24. Available at <http://www.saffm.hq.af.mil/budget/>.

## 2.2 Training Product Lines

The Air Force has a long history of successfully using modeling and simulation (M&S) for training. Air Force training can be categorized into four major types:

1. Virtual Training
2. Live Training
3. Constructive/C4ISR Training
4. Education

### 2.2.1 Virtual Training

Virtual training is training accomplished in a simulated (virtual) environment through use of simulators that range in capabilities from full mission simulators, part-task trainers, to desk-top

PC-based simulation. Effective virtual training simulates operational platforms (e.g., cockpit simulators) or equipment (e.g., gun trainers). Air Force spending on virtual training is typically represented by flight simulators and training devices for various aircraft. Due to the changing operational environment, where airmen are filling personnel gaps on the ground, there is an increasing need for Air Force virtual land training.

It is expected that Air Force expenditures on virtual training will continue to increase through 2015. This will be due, in part, to new and ongoing weapon systems procurements that will require virtual training assets. Growing training constraints, particularly escalating fuel costs and inadequate access to flight training ranges will also increase the Air Force's need for virtual systems.

Examples of virtual training include:

- Flight simulators,
- Engagement skills trainers, and
- Threat detection trainers.

### **2.2.2 Live Training**

Live training is accomplished with operators using real equipment. M&S supports live training through the provision of surrogate weaponry, environments, and targeting. Due to the constraints of escalating fuel costs and training range challenges, it is expected that Air Force expenditures on live training will slowly decrease or remain stable through 2015. One exception to this is the increasing demand for unmanned aerial systems (UAS) pilots and training.

Examples of live training that utilize M&S include:

- Aerial targets, drones and decoys, and
- Practice bombs and munitions

### **2.2.3 Constructive Training**

Constructive training is also referred to as Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) training. Constructive training is accomplished using constructive simulations to train primarily strategy and decision making. Examples of constructive/C4ISR training include: Command & Control (C2) training and exercises, threat simulators to improve coordination between players, weapons control systems, and battle-staff training. Constructive training is increasingly also being used to train operators, develop tactics, techniques & procedures for identify and combating cyber attacks and developing defense against such attacks. It is expected that Air Force expenditures for constructive training will remain stable through 2015. An example of constructive training that utilizes M&S capability is Battle staff and Ops center training and exercises.

## 2.2.4 Education

Education includes “formal” training done by the military as well as money spent on education for military members and their dependents. Education is typically provided in classroom settings, campuses, or through online computer based resources. It includes the full realm of education needs, including curriculum development, operating support and training and instructor support for DoD sponsored education. It is expected that military education spending will remain stable through 2015 as the Air Force relies on well-trained, well-educated personnel. An example of an Air Force education provider is the Air University.

## 3.0 Goals & Challenges

HQ Air Force recently (July 6, 2010) published *Air Force Modeling and Simulation Vision for the 21st Century*. This document provides guidance to ensure M&S supports the needs of the Air Force by providing agile and responsive governance and management structure to oversee M&S Air Force applications. This vision identifies two areas for which M&S is a key enabler:

1. Making better decisions, and
2. Developing better skills.

The following discussion on challenges and goals is extracted from *Air Force Modeling and Simulation Vision for the 21st Century*, available at the Air Force Agency for Modeling and Simulation (AFAMS) website (<http://www.afams.af.mil/shared/media/document/AFD-100930-038.pdf>).

## 3.1 Challenges

**Making Better Decisions** – The M&S technologies available for “making better decisions” are primarily, but not exclusively, used by the Acquisition, Analysis, Planning, Testing, and Experimentation Communities. These communities use M&S to frame and scope problems, examine alternatives, and provide insight and solutions for Air Force decision makers. The DoD Analytic Agenda can be used as a framework to provide a common set of accepted scenarios, M&S tools and authoritative data. Current challenges include (HQ USAF, 2010, pp. 10-11):

- Many M&S tools used today were designed to support a system-based acquisition process for only Air Force, not joint requirements.
- Many M&S tools lack scalability and extensibility necessary to address complex joint interoperability issues.
- Many models and simulations are proprietary and not interoperable with other tools.
- Limited ability to do exploratory analysis with quick running models.
- Limited M&S tools to support complex problem-solving.
- Limited M&S tools to manage large data sets.
- Limited use of M&S to augment actual testing for assessment of complex system of systems, within dense threat environments that may not be fully achievable on the range.

- Limited use of M&S throughout the Acquisition Life Cycle, partly due to many PMs not knowing what M&S tools exist and are available for use in specific scenarios.
- Availability of data to perform verification and validation on M&S tools.
- Lack of a centralized repository for VV&A documentation to identify M&S application validation appropriate to intended activities.
- Lack of M&S capability to analyze Irregular and Non-kinetic Warfare operations or Mission Support Activities

**Developing Better Skills** – The M&S technologies available for “developing better skills” are primarily, but not exclusively, used by the Training and Education and Formal Training Communities. The Training Community uses M&S to enhance the warfighter’s ability to train and conduct mission rehearsal in realistic LVC environments. The Education and Formal Training Community uses M&S to deliver air, space, and cyberspace education and formal training. Current challenges include: (HQ USAF, 2010, p. 11)

- Training and education policies do not maximize the use of LVC environments enabled by M&S technologies.
- Current and future weapons systems and weapons capabilities often outpace existing LVC training capabilities and facilities.
- Database fidelity is often insufficient to support required synthetic environments.
- High fidelity simulators are expensive to develop and maintain.
- Most exercise architectures are non-persistent.
- Achieving interoperability in joint and coalition environments.
- Current network security and information assurance policies, along with technology limitations, make it difficult to achieve multilevel security (MLS) and cross-domain solutions (CDS).
- Information Assurance policies may impede rapid review of capabilities.

### 3.2 Goals

Air Force seeks to have M&S meet user requirements across all Air Force activities. The Air Force particularly wants M&S solutions that are open-source, government-owned, and designed for use with multiple applications. The Air Force also seeks solutions validated using test data, operational data, or higher-resolution/fidelity models.

Many of today’s users require LVC capabilities to meet their needs. Users determine which M&S assets should be available for use in distributed LVC environments suitable for research, testing, training, and mission rehearsal applications (to name a few). These models will require additional characteristics, such as the ability to be readily integrated in a seamless environment supported by acceptable cross-domain security solutions, rule sets and operational procedures. Where possible, the M&S should be the same or consistent across all activities. Assembling a distributed LVC environment should be like scheduling resources on a range – seamless, integrated, scalable, and capable of meeting user requirements. Furthermore, rapid data generation capabilities allow for discovery of appropriate resources from available models, simulations, simulator facilities, and datasets for quick assembly of particular applications.

Making better decisions and developing better skills will lead to improved Joint Force Commander air, space, and cyberspace power employment.

**Making Better Decisions** – The framework for making better decisions requires the following: (HQ USAF, 2010, pp. 11-12)

- A systems engineering approach to maintain and share M&S tools, data, and assumptions used to support program/system (or other study) decisions and make the information available to support or inform future decisions.
- M&S tool improvement and data generation requirements driven by and derived from the need to support decision making and operations.
- As appropriate, standards that require consistent M&S capability representations and data be developed and maintained throughout the life cycle of AF systems.
- A common set of M&S tools and data (e.g., forces, CONOPS, system characteristics and performance data) available and readily accessible to support all AF M&S user communities (leverage and influence Analytic Agenda products).
- M&S that supports system of systems and/or net-centric requirements as part of a capability-based development and acquisition process.
- Quick-running models useful to rapidly explore capabilities of systems under development and test.
- Virtual M&S to mitigate live test limitations while increasing opportunities to emulate the operational environment for assessing system of systems and/or net-centric performance requirements.

**Developing Better Skills** – The framework for developing better skills requires the following: (HQ USAF, 2010, p. 12)

- Virtual network support to link Airmen together in collaborative educational and training environments—from enlistment to retirement.
- Unclassified scenarios supported with multi-use databases. The ability for geographically separated units to conduct horizontally and vertically integrated full-spectrum training, mission rehearsal, and operations in a Joint/Coalition force environment against realistic threats.
- On-demand, integrated, immersive, and operational environments able to accommodate multiple and varying warfighting teams at appropriate levels of detail.
- Leveraging of private-sector practices and technology, including extensive use of online gaming to train diverse audiences in a wide variety of individual and collective skills.
- Personnel trained as experts in M&S to serve as educators and trainers.

**Shared Desired End State** – The Integrating Architecture shall support: (HQ USAF, 2010, pp. 12-13)

- A common, cross-community methodology to identify and prioritize AF/DoD corporate and cross-cutting M&S and data requirements based on the —value-added□ contribution to the M&S end-user.

- M&S based on a coherent set of government-owned data.
- Discoverability and accessibility of M&S tools and data.
- Verified and validated M&S that is reusable from one community to another.
- M&S that represents joint warfighting capabilities at varying levels of fidelity and resolution.
- Compliance with standardized architectures and interoperable databases.
- Multilevel Security (MLS)/Cross Domain Solutions (CDS)/Multi-National Information Sharing (MNIS) solutions, including full MLS/CDS for individual weapons/weapons systems, allowing full protection and ability to participate in full-spectrum, immersive environments.
- Affordable, efficient, composable, scalable, and schedulable M&S.
- Standardized, robust environmental and analytical scenarios available across simulation domains.
- Model management standards and best practices, including adopting industry accepted software development practices and standards, to ensure software is maintainable throughout its lifecycle.
- Conduct of system testing and/or experimentation within a training event where the objectives of each event can be effectively merged.

### **3.2.1 Fiscal Constraints**

While Air Force expenditures on training and M&S solutions are expected to remain stable or in some cases increase, the Air Force expects to do more with its money. Continued fiscal pressures will result in the need to produce accurate forecast and stay on the spend plan. Furthermore, fiscal constraints will lead to smarter use of available funds – leveraging investments by combining multiple requirement areas to achieve a single, combined solution. Future budget allocations are expected to require consolidation of training programs. The Air Force also expects training systems to be cheaper to operate and maintain, while maintaining a balance between sustaining the old while developing the new.

### **3.2.2 Security Issues**

Air Force training requirements include a number of security issues. Trainees come from a range of security backgrounds, making multi-level security (MLS) capability very important. MLS presents a huge challenge to developers. Most Air Force training applications must include multi-level security features. Considerations include, “Need to know” versus, “Need to share”.

## **4.0 Organizational Acquisition Strategies**

### **4.1 Training System Product Group**

Each major command of the Air Force may call on the Training System Product Group (TSPG) for support in acquisition of training devices. TSPG is an umbrella term to describe the Air Force organizations that support warfighter training through the use of modeling and simulation techniques. Collectively, the unit provides the warfighter with a full range of training system

lifecycle support. (<http://www.teamorlando.org/members/airforce/airforce-tspg.shtml>). The TSPG mission makes the unit more of a provider of training systems than a user. In this role the unit leadership has a unique point for observing the broader training systems requirements for the coming years. TSPG is comprised of the three following organizations.

The **667th Aeronautical Systems Group**, Wright-Patterson AFB, Ohio, is the lead acquisition center for the group, arming the warfighter with world-class weapon systems to enable combat aerospace forces to ensure global vigilance, reach and power. Its acquisition work force and support units deliver combat capabilities to the warfighter, which meet performance, cost and schedule expectations. Its major acquisition programs include fighter, bomber, mobility/transport, reconnaissance, special operations and trainer weapon systems. Units include 88th Air Base Wing, Fighter Attack Systems Wing, Long Range Strike Systems Wing, Reconnaissance Systems Wing, Mobility Systems Wing, Agile Combat Support Systems Wing.

The **Air Force Research Laboratory (AFRL), 771st Human Performance Wing**, Mesa, Arizona, conducts research and development supporting training systems. Areas of current emphasis include immersive environments, mission support, continuous learning, cognitive models and agents, and operations support. (See <http://www.mesa.afmc.af.mil/snt.html> for more information on AFRL research programs.)

The **507th Aircraft Sustainment Squadron** (Air Force Materiel Command), Hill AFB, Utah, provides training system sustainment support, particularly in the areas of Air Mobility Command training, Special Operations Forces training, Air Combat Command heavy training systems, and fighter training systems.

## 4.2 Air Force Agency for Modeling and Simulation

Modeling and simulation (M&S) issues of a more constructive nature tend to fall in the mission of the Air Force Agency for Modeling and Simulation (AFAMS). AFAMS a field operating agency of the Warfighter Systems Integration Directorate, Warfighting Integration and Chief Information Officer, Secretary of the Air Force. AFAMS serves as a de facto M&S requirements clearing house, as the Air Force has no organization designated for that purpose. It is the executive agent for the Air Force M&S Tool Kit, a collection of accepted implementations of M&S solutions. AFAMS is working to improve the quality of requirements and how requirements are prioritized in this era of complex battlefields.

AFAMS is located in Orlando's Central Florida Research Park, with DoD, Joint, service, contractor, and educational organizations focused on modeling and simulation (M&S). Proximity to these other agencies offers the Air Force the maximum leverage and advantage of the developing programs and technologies enhancing the Air Force ability to provide ready forces.

## 4.3 Major Contract Vehicles Used for Training

TSPG staff members expect the Training System Acquisition (TSA) contract to continue as the primary contract vehicle, subject to changes in the political environment. The pace of source

selections is increasing resulting in fewer long-term contracts. Future acquisition strategies are counting on a very competitive industry with overall good performance.

#### 4.4 Projected Future Acquisition Strategies

AFAMS identified several training system concerns that will have significant impact of selection of training solutions. These include:

- Supportability and Maintainability
- Standards and compatibility (this is a huge impact on choices made)
- Concurrency with the prime weapon system
- Operating and Maintenance costs

TSPG is working through significant workforce development issues related to re-organization within TSPG and consolidation of staffs from other facilities. TSPG is also training new acquisition staff as part of the re-organization. OJT and experience are useful in getting new staff to a productive level. Often, a young workforce with little experience being put in lead roles. TSPG is addressing the unique workforce development and education needs relating to acquisition scrutiny by updating policies and consolidating processes

AFAMS believes their M&S workforce development suffers due to the Air Force having no M&S career field. Personnel who work M&S issues generally are in the IT career field. This leads to issues in advancement documentation due to M&S experience being external to the career development path. This has impacts on hiring and transfers. An experience indicator is needed. Academia is beginning to offer a PhD in M&S. An Air Force career field is needed to give structure to M&S. M&S does not currently fit career development for many Air Force professionals. The M&S career issue also applies to the acquisition community in M&S. The Acquisition University is a start toward addressing this issue

#### 5.0 Market Trends and Technological Initiatives

Interviews with Air Force personnel identified several technological training issues to be addressed through 2015. TSPG staff expects:

- More training to move to simulation-based training devices with networking capabilities;
- Strong emphasis is expected on homeland security applications; and
- Greater emphasis on Distributed Mission Operations (DMO) training, especially among low-level platforms.

TSPG staff reports source selection process scrutiny is driving process changes, and expects that more interaction and more reviews will be the norm. The TSPG staff ranked a number of potential training system issues that are expected future selection and design of training systems:

- Effectiveness
- Affordability
- Interoperability

- Upgradability
- Modular, open systems,
- Rapid threat changeability,
- Scalability
- Deployable
- Concurrency

Gaming technologies in general are expected to lead to training advances, particularly in the development of user interfaces with touch technologies versus applications that require text entry interfaces. The TSPG staff reported commercially developed gaming technologies offer promise for Air Force training applications. Young pilots expect their training to be at least as good as what they can do at home on their family PC system. Important related technologies include gaming, physics engines, networked training, graphic cards, and hand-held trainers.

Interviewees also identified a number of critically needed technologies to meet training requirements:

- Tools to develop requirements for Distributed Mission Operations (DMO) exercises
- Networked training systems was expressed during each interview
- Multi-level security solutions
- Aero model fidelity
- Embedded training for tanker boom operators
- Improved medical training simulations
- Simulation programs include MAF DMO tanker BMT capability

AFAMS staff believes there are a number of gaps in training that are not addressed or are inadequately addressed by training devices.

There is a need for standards and policies with regard to network access to training events. These concerns extend to coalition training issues. Solutions are needed that cross domains.

## **6.0 Outlook/Summary**

Compared to the Cold War Era today's battlefield has gone from an enemy that was easy to find but hard to kill to an enemy that is hard to find but easy to kill. The threat has changed such that homeland security issues are significant. Consequently, operational personnel must be more dynamic in their battlefield, which must be reflected in training capabilities.

The Air Force will continue to rely on M&S solutions for their training needs. TSPG personnel see advantages of training systems and simulation that include: cost savings, safety, unique training events such as DMO, leaving live asset available for operations, emergency procedures training, ease or instruction. Integrated LVC networks offer important training events that would be impossible using standalone systems. The TSPG staff believes training systems use is on the verge of a revolution that will see simulation applications in a broad spectrum of training application far beyond flight training. Further applications of training systems potential include

live-virtual-constructive events, wider use of DMO, gaming, high fidelity scenarios. Rapid database development allows mission areas to be anywhere.

Future training systems are expected to be more affordable; more cost effective (leveraging resources across other training systems and system components); interoperable; easy to deploy, operate, and maintain; concurrent; and utilize advance simulation capabilities.

## 7.0 Sources

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