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Acronyms

ACR	Air Cavalry Regiment
ADL	Advanced Distributed Learning
ANG	Air National Guard
ARNG	Army National Guard
ATC	Air Traffic Control
BFTT	Battleforce Tactical Trainer
C^3I	Command, Control, Communications and Intelligence
CCTT	Close Combat Tactical Trainer
DHS	Department of Homeland Security
DMT	Distributed Mission Training
DOD	Department of Defense
DOT	Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
ICBM	Intercontinental Ballistic Missile
M&S	Modeling and Simulation
NTSA	National Training Systems Association
OSD	Office of the Secretary of Defense
PC	Personal Computer
R&D	Research & Development
SOF	Special Operations Forces
U.S.	United States
USAF	United States Air Force
USCG	United States Coast Guard
USSOCOM	U.S. Special Operations Command
WAN/LAN	Wide Area Network/Local Area Network

1.0 EXECUTIVE SUMMARY

1.0.1 PREFACE

This year more than any other since NTSA began publishing the *Training 2010 Survey*, it has been extremely difficult to collect and assimilate data necessary to publish a meaningful report. The *War on Terror* caused an immediate shift in National policy and with it changed many of the training goals and objectives that formed our industry for decades before. Major changes occurred in the command structure, budgetary plans, operational authority and training needs. Interviewees were not available to speak with NTSA interviewers as candidly as in the past for security reasons, for reasons dealing with politics and for reasons dealing with unresolved budget issues. Natural disasters from Hurricanes Katrina, Rita and Wilma strained federal resources and have impacted several programs in the DOD budget. Fuel costs have driven live training costs extraordinarily high and presented an opportunity to the training community to evolve what was once live training into the virtual and constructive training domains. The chairmen of each section have done a magnificent job at ferreting out information for NTSA members. The outlooks and trends are solid. The specific numbers associated with given programs are less solid, given the fiscal uncertainty brought about by hurricanes and terrorists. The bottom line for our industry is a bright future, but the character of the training solutions is being significantly altered.

1.1 INTRODUCTION

The National Training Systems Association (NTSA) commissioned a team of training experts drawn from its member companies to produce the *NTSA Training 2012 – Released for the Year 2006* market survey. The survey captures the requirements, trends, and forecasts for the decade ahead in defense and the federal government. There are also implications for commercial markets.

The project team refocused the questions to our customers and to include the Department of Homeland Security and the two dozen supporting agencies. Details of this decision can be found in the Department of Homeland Security section of this Executive Summary.

The project team was divided into market committees to facilitate the broadest possible survey of target markets. The committees met with high-level officials, and conducted face-to-face interviews and on-site evaluations to compile a comprehensive assessment of future training and simulation needs.

Market segments covered in the survey include: 1) the military services (e.g., Army & Special Forces, Navy, Air Force, Marine Corps), 2) Joint Training, 3) the Congressional Outlook, and 4) the Department of Homeland Security.

1.2 OUTLOOK

1.2.1 Defense

Joint Operations and Joint Training have become more the norm than prior to 9/11. There is a significant number of dollars being added to increase bandwidth needed to support HLA federations and connect both real world operations and the training needed to prepare for those operations. Training scenarios that involve allied and coalition forces to deal with changing terrorist strategies have vastly improved training provided to state and local public servants and to the citizen soldiers in our National Guard and Reserve Forces. Guard and Reserve service in the war zones has strained the classic training systems these services were used to at the turn of the century. DoD's training resources (approximately $35B annually) have been refocused to "connect" warriors using ADL and HLA structures to facilitate web-based training and Distributed Mission Training. For Guard and Reserve forces this has not been without some problems. Nevertheless, training content is being provided to Guard and Reserve forces much more efficiently and effectively than ever before. New training tools that depend on virtual training environments have significantly impacted the time to train and ease of recertification.

Training budgets have been increased significantly over the FYDP. Although the details of the DOD budget were still being worked out at the time this document was created, it is clear that training and readiness tools provided by our industry are offering services with new options that will provide as good or better training than past practices at much lower costs. Fuel costs are becoming a big driver in the federal budget driving many exercises into virtual and constructive training domains where only live training once occurred.

Combat equipment budgets have risen significantly since 2001. Wear and tear in the war zones plus life cycle extensions of war equipment have taken a toll on equipment reliability and maintainability. Live training in the combat equipment is much less attractive today because the maintenance cost per training hour has risen so significantly.

Training ranges are slowly being closed for various reasons. Replacing the live training that previously occurred on these ranges with virtual training such as "Virtual Flag" has improved the economics of training significantly and greatly improved the effectiveness of live training that warriors receive. This phenomenon has matriculated from expensive aircraft training events to the soldier.

Additionally, hurricanes Katrina, Rita and Wilma have significantly altered the federal budget plans and defense budget over the FYDP. Accordingly, final numbers from POM-08 are likely to differ from the table below however, all arrows are pointing up as a result of the war on terrorism. Service by service, the trend is unmistakably up for virtual and constructive training environments and down for live training that puts heavy use on equipment.

DoD Discretionary Budget Authority by Service ($ Billions)

	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11
Army	100.0	111.5	117.5	121.5	124.2	126.7
Navy/Marine Corps	119.2	125.6	129.0	143.3	147.5	153.3
Air Force	127.5	133.3	139.2	138.7	142.2	146.8
Defense-wide	66.2	69.3	71.1	78.5	78.2	75.5
Total DoD	419.3	443.1	462.4	482.0	492.1	502.3

DoD Discretionary Budget Authority by Title ($ Billions)

	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11
Military Personnel	108.9	112.0	115.4	119.4	123.3	127.1
Ops & Maintenance	147.8	154.1	160.8	167.3	172.1	177.4
Procurement	78.0	91.6	101.4	105.3	111.3	118.6

The budgets shown above were still being adjusted at the time of this writing. Although the numbers may decline in each cell, trends are unmistakable. Training budgets (although not broken out separately) follow closely the personnel and O&M budget plans.

Other issues under discussion in the Legislative and Executive branches of government are the role of active duty Armed Forces during natural disaster response and recovery. Although this responsibility is not new for National Guard forces, adding domestic disasters to the already long list of services training needs.

1.2.1.1 Army

The Army has found a balance between high fidelity and lower fidelity training systems to ensure training task accomplishment at the appropriate level. The Army is focusing on distributed training as an alternative to resident instruction to meet the training challenges shown below:

- High Operational Tempo of service members
- Need for deployable training systems
- Need for affordable training devices
- Lack of adequate ranges (space and instrumentation)
- Lack of common training databases
- Need to train new threats introduced with terrorism
- Need to interface with other services in joint operations and exercises
- Need to integrate Reserve and National Guard forces
- Integration of Future Combat Systems (FCS) into the Army training architecture.
- Integration of UAV assets
- Cost of fuel

As the call for change to Army training continues, Distributed Training is becoming an integral part of the training system. Army training and simulation needs are undergoing change as the requirement "pull" and the technology "push" moves the Army from the current legacy systems to a family of simulators and simulations required to support the 21st century, information age Army. Life Long Learning has become TRADOC's battle cry.

1.2.1.2 Air Force

Several activities continue to have a serious impact on United States Air Force (USAF) training, including:

- Expansion of the DMT environment other Air Force weapons platforms
- Emphasis on future requirements for expanded distributed learning environments across a variety of training approaches
- Focus on plans and programs for the 21st century
- Continued emphasis on the USAF role in Space
- Mission rehearsal needs and requirements
- Integration of UAV and UCAV assets
- Cost of fuel
- Range closings and limitations

All herald major changes in the way the USAF will prepare its personnel to execute their missions and procure technologies and capabilities in support of that preparation.

The award of successive DMT programs has provided a series of weapons platforms to approach training in a virtual distributed environment. This has also led to a more expansive view of distributed learning environments with the development of a distributive learning plan resulting from the directives of the Office of the Secretary of Defense (OSD). This plan seeks alternative learning approaches across all types of training to provide the training to Air Force personnel on time, as required, in an environment that fosters the "train as you fight" initiative.

In addition, the USAF continues to increase its reliance on flight training and mission essential competency readiness through distributed exercises. The number of joint procurements and initiatives Modeling and Simulation (M&S) is growing.

1.2.1.3 Naval Forces

1.2.1.3.1 Navy

The Navy has stepped up to its training needs in a big way. Spurred by the Chief of Naval Operation's Human Capital initiative, all parts of the Naval Service has embarked on a new and improved approach to training. Central among this effort is interactive training between naval ship and aviation platforms. The Naval Aviation Simulation Master Plan (NASMP) has capitalized on the lessons learned by the USAF DMT program to construct an interactive training system which should allow naval aviation units to learn and practice in real time with other type/model/series aircraft and crews.

Manpower costs are a significant portion of the Navy's budget and training issues are a large part of that cost. In an effort to reduce the overall cost of manpower to fight the Navy's warships and aircraft, the CNO's Human Capital initiative uses scientific methods to reduce ship crew size to less than half those crews manning today's ships. Clearly, training will become more important as automation of ship hardware and software take on larger roles. To accomplish the technical training required individual, high fidelity, fixed base simulators will replace unit training devices. Additionally the Navy expects to fund programs providing transportable media, low cost simulators and training devices that provide just-in-time or scaled training. Embedded training is being looked at as an option for all new weapons systems at sea, but aviation systems seem to be migrating toward more powerful and smaller computers with robust course content and web-based interactive simulations.

Commercial Off-the-Shelf products will be the norm. Analytical computer programs to measure performance, learning methodologies, and instructional technologies are all required to refine the Navy's *21st Century Training Plan* and to meet the changing demographics of the next generation's sailor and equipment.

The greatest growth will be in more and better computer based training, affordable distributed mission training equipment, and deployable mission rehearsal systems.

1.2.1.3.2 Marine Corps

The Marine Corps has taken on the war on terrorism head on. In keeping with the Corps' austere approach to warfighting, industry they have altered their training content significantly since 2001. Constrained budgets, ranges and time available will continue the trend toward increased use of simulation for training. Live training in compounds that resemble urban warfare is a good example of a low cost training technique USMC uses prior to sending Marines into the war zone. This live training is enhanced using a series of virtual and constructive training systems to prepare Marines prior to arriving at the live "range." The virtual and constructive

training tools used to prepare Marines for the range and eventually the battlefield has significantly shortened the time to train, improved retention and lowered overall costs.

Marines continue to stress deployability is a key requirement for both ground and aviation training systems. Also, the Corps is writing embedded training into most of its ground systems requirements documents.

Networked systems for distributed training is a fundamental requirement for both Marine ground and aviation training systems and is a theme of the Marine Corps Aviation Master Plan. For Marine Corps Aviation, the high cost of training ammunition and weapons are factors driving the increased use of simulation for training. Other significant factors include the desire to reduce wear and tear on an aging aircraft fleet, the high cost per hour of operational aircraft, high fuel costs, the ability to train personnel in a simulator to do a large number of tasks that are not practical in the aircraft, and safety.

The Marine Corps is evaluating a wide variety of means to improve the methods of Individual Instruction, and the number of personnel trained at one time on simulators. Web-based training systems are improving the access to training materials and have helped manage training courseware configuration control. An innovative in-house effort is also looking at providing CD ROM or wireless systems to students for use in organic or embedded computers available on the job.

In Staff Training, there is a strong emphasis on Corps participation in joint exercises and the development of the systems and interfaces needed for that participation.

1.2.1.4 Special Operations Forces

Special Operations Forces (SOF) operating from its headquarters at McDill AFB, FL has mixed mission planning with training more than any other part of the US Armed Forces. Under the direction of USSOCOM, the SOF have created a set of training and mission planning tools that blur the lines between training and operations. These tools allow for increased fidelity and “free fly” through a large area database with 3-D modeling. The tools allow SOF to interconnect in an HLA environment to train, conduct mission planning, conduct mission previews and conduct mission rehearsals. Each of these four general tools utilize the Mission Training and Preparations System using a common virtual environment to provide high fidelity interactive training and mission preparation. An open architecture will be applied to new MTPS systems, modifications, and upgrades emphasizing commercially supported practices, products, specifications, and standards. The MPTS will support access to new technologies and products and facilitate modernization of training systems already fielded supporting interoperability and reusability. The MTPS also supports the use of data formats that are independent from applications, and applications that are independent of hardware. This approach has allowed SOF to reduce or eliminate reliance upon proprietary standards, interfaces, or designs.

Key to this effort has been the Common Environment/ Common Protocol initiative that provides a standard networking design, protocols and associated configuration management practice. The results allow SOF MTPS interoperability protocols designs to support participation in joint intra-service and inter-service network exercises. It also allows the MTPS system to evolve with new DIS/HLA standards and interfaces.

Traditional approaches that support mission planning, preview and command & control operations are disparate systems driven by proprietary data formats specific to each application supporting mission preparation and execution. Using current commercial and government data standards, compression and streaming techniques and expanding networking bandwidth, the MTPS provides a common correlated 2D/3D synthetic database with live multi-intelligence entity feed. This approach makes it now possible to synchronize and distribute the virtual, live and constructive environments for mission training, preparation and operations.

The Common Synthetic Environment is a key ingredient needed to complete the SOF MTPS. It is being developed for several mission rehearsal systems and should see initial training units ready for training in the next few months.

1.2.1.5 Joint Training

Joint training has become the fastest growing area of training within DOD. To facilitate this principle effort for training and education is HLA and ADL. The rapid change of current systems means that new and faster ways must be found to complete the traditional "analyze, design, develop, implement, evaluate" process for training development.

There are three capabilities that form the foundation for Training Transformation. Through the following capabilities, combatant commanders--the ultimate focal points for joint operations--will receive better, prepared forces that are aligned with their needs:

Joint Knowledge Development and Distribution Capability: Preparing future decision-makers and leaders to employ joint operational art, understand the common relevant operating picture, and respond innovatively to adversaries. It will develop and distribute joint knowledge via a dynamic, global-knowledge network that provides immediate access to joint education and training resources.

Joint National Training Capability: Preparing forces by providing command staffs and units with an integrated live, virtual, and constructive training environment that includes appropriate joint context, and allows global training and mission rehearsal in support of specific operational needs.

Joint Assessment and Enabling Capability: Assisting leaders in assessing the value of transformational initiatives on individuals, organizations, and processes. It will also provide essential support tools and processes to enable and enhance the Joint Knowledge Development and Distribution Capability and the Joint National Training Capability.

All of these initiatives are supported by numerous Joint programs such as JSIMS, the JNTC and others. The training industry and from a larger perspective the Modeling and Simulation community have a bright future providing state of the art training systems to Joint forces commands.

1.2.2 Congressional Perspectives

Government spending for U.S. military training, training support and simulation is generally pegged at somewhere around 8% of overall departmental budgets (about $35B annually). Defense Department spending is expected to rise approximately 10% per year for the next two to three years. However, much of this increase will be consumed by operations of existing training systems and connecting simulations in support of the services DMT programs.

Understanding that the training industry is involved in real and practical applications of cutting edge technologies, several members of Congress have formed the ***Congressional Modeling and Simulation Training Caucus***. The fast growing caucus chaired by Congressman Randy Forbes (R-VA) is rapidly expanding as members join the caucus and begin to understand the impact of state of the art systems being applied to training and modeling and simulation.
The Caucus can provide our industry a much needed voice to articulate the advantages of our products and services and to interface with requirements generation from DOD users. The Caucus is actively involved in I/ITSEC and other training industry forum. Using the I/ITSEC forum, it is clear that our industry has a unique opportunity to show our "stuff" at a new level.

1.2.3 Department of Homeland Security

The Department of Homeland Security (DHS) has significantly expanded its role since Training 2010 was released 3 years ago. Along with this expansion there has been an increase of the potential customer base for our members. Markets have developed in the following areas:

- Training and evaluation for federal, state and local transit agencies
- State and local governments
- First Responders (fire, police and EMS)
- Private sector
- Federal agencies (Agriculture, Health and Human Services, etc)
- Commercial Vulnerability Assessment and Critical Infrastructure Protection
- Emergency Response

Unfortunately training budgets are slim and focused at the state and local rather than the federal level. Nevertheless, lessons learned during the emergency evacuation and response to hurricanes Katrina, Rita and Wilma emphasize the need for good training and solid communications systems that DOD forces have, but are not widely in use by DHS personnel.

Much of what we in the defense training community provide can be leveraged into these non-traditional markets. However, it will require an understanding of how state and local governments operate. We can provide the important lessons learned

from our initiatives to these new markets. The NTSA training community will be able to bring to bear industry best practices, e.g. ISO 9000, SCORM and AICC, at the state and local level and to non-traditional areas such as Department of Agriculture, Department of Commerce, Health and Human Services, etc.