Training and Testing for Acquisition

Theater Battle Management Core System
- T B M C S -

National Defense Industrial Association

5th Annual Testing and Training Symposium & Exhibition

19-22 August 02          Orlando FL

Marcie Zaharee, Training Manager, ESC/AC
Capt Kevin Crocco, Test Manager, ESC/AC
Overview

- **Background**
  - What is TBMCS, and what does it do?

- **Past**
  - TBMCS 1.0.1 Training Review FY02

- **Present**
  - In Response to the Warfighter -- Sep 11th

- **Future**
  - Acquisition Challenges
Background

What Is TBMCS?

An Integrated Planning and Execution System Providing the JFACC Command and Control of All Air Operations To Include Theater Missile Defense

- Application DB
- Stovepipe Systems
- Not Y2K

One System Integrating All Air Resources

- Common Intel DB
- Common Tools
- System Wide Data Access/Distribution
- Y2K
- DII/COE Compliant
- ATO
Background
What Does TBMCS do?

Air Planning and Execution Cycle

**Strategy Division**
- Strategic Planning

**Combat Plans**
- Air Battle Planning

**Intelligence**
- Reporting & Analysis
- Mission Preparation
- Mission Execution
- Flying Units
- Combat Operations
- Combat Assessment

**BMC3 SPO**
Goals for TBMCS 1.0.1 Training Evaluation FY02

- Provide an in-depth analysis in assisting future System Program Directors in determining *what conditions distributed learning is likely to be effective for C2 systems*
- Provide a holistic view of TBMCS training that shows the impact of training, not only on the individual but on the USAF as well
TBMCS Training Review
ISD Process

● Analysis
  ● Best Practices-Training covers 2,140 tasks from force to unit processes
  ● Lessons Learned-A TASA is a critical component of the ISD process—all future strategies are based upon the results.

● Design
  ● Best Practices
    ● Spiral development costly for paper based materials. Considerable savings resulted in using HTML materials to support spiral testing and fielding
    ● Material available anytime, anywhere, anyplace
  ● Lessons Learned
    ● Limited communities of practices to compare web design techniques due to new technology
TBMCS Training Review
ISD Process, cont.

● Development
  ● Best Practices-Quick conversion to web and availability to students
  ● Lessons Learned-Lack of technology planning. Need for: infrastructure assessment, necessary bandwidth, and AFCA involvement in local computer security.

● Evaluation of Training
  ● Preliminary assessment users disliked self-paced and web-based environment
    ● Customer Expectations High
  ● Affected system of record decision
    ● ESC required to revert to instructor led hands-on approach and maintain web development
    ● Very costly decision
      ● Material development per student $2471.25
      ● Cost of MTT's per cost of student $6046.37
      ● Cumulative cost per student $8517.62
Kirkpatrick Level IV

I – Reaction
- End of Course Questionnaire
- Focus Groups

II – Learning
- Pre/Post Test

III – Transfer
- Self-assessment “ability to perform task”

IV – Business Results
- Not Collected

Total Trained 812 (Operator, SA, and PSS)

- Air Force 443
- Marine 307
- Navy 34
- NORAD 38
Findings Question #1
Were the Majority of Students Satisfied at the Completion of Training?

<table>
<thead>
<tr>
<th></th>
<th>Ops</th>
<th>SA</th>
<th>PSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not Respond</td>
<td>24.07%</td>
<td>19.9%</td>
<td>30%</td>
</tr>
<tr>
<td>Agreed tng met expectations</td>
<td>53.57%</td>
<td>69.76%</td>
<td>65.7%</td>
</tr>
<tr>
<td>Disagreed tng met expectations</td>
<td>22.02%</td>
<td>10.23%</td>
<td>4.26%</td>
</tr>
</tbody>
</table>

- Agreed range is low, there is room for improvement in the courses
- Focus groups and observations revealed:
  - Pre-conceived and/or negative attitudes by students against TBMCS system and/or against LMMS
  - Students showed resistance to learn without the instructor (web)
  - Persistence and voluntary engagement in task was seldom noticed.

*Exception was 152, 157 ANG. Students were motivated, eager to learn, great attitudes and disposition. Facilities were also the most prepared.
Findings Question #2
Will there be a difference in the student test scores after completing the training?

<table>
<thead>
<tr>
<th></th>
<th>Ops</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td>54.87%</td>
<td>45.5%</td>
</tr>
<tr>
<td>Post Test</td>
<td>87.62%</td>
<td>87.5%</td>
</tr>
<tr>
<td>Avg Gain</td>
<td>32.7%</td>
<td>42%</td>
</tr>
</tbody>
</table>

With all students shifting from a below average score (<75%) to above average (>75%) data suggests that learning objectives were met as a result of the instruction AND a knowledge transfer took place.

*PSS was a new skill set. Students did not have an experience prerequisite. They were not provided pre/post-tests.
Findings Question #3
Will users be confident in their ability to perform key tasks upon completion of the training?

With a cumulative total of 91.4% students stating that they could complete the key tasks with over-the-shoulder help, on-line help, or without help vs. 1.4% stating they could not accomplish the key tasks, data suggests the students perception of their ability to perform key tasks is high.
Findings Question #4
Is there a correlation between user experience and EOC satisfaction?

Data suggests a correlation exists, however without access to raw data a true correlation could not be determined.

Observations and focus groups revealed:
- Students who did not meet the prerequisite of 12 mo legacy/or TBMCS experience displayed
  - Lack of knowledge of duty position
  - Higher frustration levels
  - Quick to judge instructors knowledge

The didactic personality in most SA led to collaboration/teambwork to resolve problems/differences during training.

<table>
<thead>
<tr>
<th>Experience</th>
<th>Ops</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Mo Exp</td>
<td>12.54%</td>
<td>31.43%</td>
</tr>
<tr>
<td>Less Than 12 Mo Exp</td>
<td>64.5%</td>
<td>48.96%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expectations</th>
<th>Ops</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Met</td>
<td>53.57%</td>
<td>69.76%</td>
</tr>
<tr>
<td>Did Not Meet</td>
<td>22.12%</td>
<td>10.23%</td>
</tr>
</tbody>
</table>
Findings Questions 5 & 6, cont.

Findings Question #5. Will the students perceive the facilitator as knowledgeable about the course content?

- Did Not Respond
  - 27.38%
- Strongly Agreed/Agreed
  - 72.55%
- Strongly Disagreed/Disagreed
  - 3.15%

Findings Question #6. Will students perceive the course covered key TBMCS skills specific to their work center?

- Did Not Respond
  - 23.59%
- Strongly Agreed/Agreed
  - 61.73%
- Strongly Disagreed/Disagreed
  - 13.92%
Findings Question #7. Will students perceive that their units provided a workspace that supported a successful training environment?

- Did Not Respond
  - 30.58%
- Strongly Agreed/Agreed
  - 57.93%
- Strongly Disagreed/Disagreed
  - 11.31%
TBMCS Training Review
Barriers and Issues

- Inconsistent Funding
- Evaluation
  - Lack of clarity in regulations
  - No established criteria from test community
  - Performance standards not identified at NAF/Service
- Lack of OJT and Continuation Training Plans
- Technology Planning
  - “hop” on the web bandwagon with out a long range plan
- Policy and Management
  - Change agent
  - Enforcement
  - Lack of CONOPS
  - No certification program
- Changing Roles of Presentation Media, Instructors, and Students
- Design of Web-based Training Materials
Section II -- The Present
In response to the Warfighter

- Training
- Change in Acquisition Strategy
- Testing

Provided HW, SW, installation support, training, and over the shoulder support for real world events such as Noble Eagle and Operation Enduring Freedom
In Response to the Warfighter Training

- Just in Time
- Over the shoulder
- Subject Matter Experts
- CD/Web

Homeland Defense

Multi-Service Support
In Response to the Warfighter Acquisition Strategy

- Loss of funding
- Initial reduction in manpower for testing
- Implemented spiral development earlier than anticipated
- Focused on smaller system builds not requiring reinstallation
In Response to the Warfighter Acquisition Strategy, cont.

AFI 63-123 Evolutionary Acquisition
“Spiral Development”
In Response to the Warfighter Acquisition Strategy, cont.

The Bus Stop Schedule

- Three Spirals, One Increment every Two Years
  - Spirals; September-March-September
  - 2\textsuperscript{nd} March; an Increment

- We will schedule back from these dates the required actions to include requirements definition
  - When requirements will be cut off to meet release
  - Meeting dates will be known months in advance
  - Personnel needed for testing will have plenty of notice

- If one of the anticipated enhancements is not ready, there will be another “bus” six months later
Evolutionary Acquisition Testing

- **Pro’s**
  - User Centric
  - Less manpower intensive testing
  - Less time needed for testing

- **Con’s**
  - Service concerns AFI is not a regulation
  - Product driven vs. schedule driven
  - Fielding too fast to become proficient
  - Service Pack Distribution
Section III -- The Future

Training and Testing for Evolutionary Acquisition
Section III -- The Future Testing & Acquisition

• Testing
  • Insure spiral test team members are knowledgeable about the system under test
  • Some test manager responsibilities may need to be delegated to “increment program managers”

• Acquisition
  • Ensure funding, resources, and documentation are in place prior to fielding C2 systems.
Section III -- The Future Training

• Training

  • Develop and procure training systems (e.g., simulators and trainers) to emulate the characteristics of the system vs. MTT reliance.
  
  • Must incorporate a “train the way we fight” mentality
  
  • Budget for initial qualification training prior to system fielding
  
  • Implement certification program
The Future Challenges

- Paradigm change
- Mentoring others on process
- Doing more with less
  - Money
  - People
Summary
Training and Testing for Acquisition

Past -- TBMCS Training Review
- TBMCS Training Analysis, Design Development and Fielding
- Data Gathering and Findings
- Barriers and Issues

Present – In Response to the Warfighter
- JIT support to deployed locations
  - Program Office response to real world events
- Training and Testing for Spiral Development
  - Pros & Cons

Future – The Challenges
- Training and Testing for Evolutionary Acquisition