Supportability Assessment in T&E: A Tool for Better Acquisitions

Dr. Mike Bridgman
Logistics Management Institute
March 2001
National Summit on U.S. Defense Policy: Acquisition, Research, Test and Evaluation
<table>
<thead>
<tr>
<th>Report Date</th>
<th>Report Type</th>
<th>Dates Covered (from... to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26032001</td>
<td>N/A</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title and Subtitle</th>
<th>Contract Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supportability Assessment in T&amp;E: A Tool for Better Acquisitions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Project Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridgman, Mike</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performing Organization Name(s) and Address(es)</th>
<th>Performing Organization Report Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics Management Institute</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sponsoring/Monitoring Agency Name(s) and Address(es)</th>
<th>Sponsor/Monitor’s Acronym(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDIA (National Defense Industrial Association 2111 Wilson Blvd., Ste. 400 Arlington, VA 22201-3061</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distribution/Availability Statement</th>
<th>Sponsor/Monitor’s Report Number(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved for public release, distribution unlimited</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplementary Notes</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Abstract</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Subject Terms</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Report Classification</th>
<th>Classification of this page</th>
</tr>
</thead>
<tbody>
<tr>
<td>unclassified</td>
<td>unclassified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classification of Abstract</th>
<th>Limitation of Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>unclassified</td>
<td>UU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
</tr>
</tbody>
</table>
Three Questions

Why worry about supportability during acquisition?

Why use T&E to asses supportability?

How can T&E be used to assess supportability?
Elements of Supportability

- Supportability
  - Availability
  - Deployability
  - Reliability
    - Durability
  - Maintainability
    - Support Equipment
      - Maintenance Manpower
    - Documentation
      - Technical Data
    - Packaging, Handling, Shipping, Transportation
    - Facilities
  - Operator Support
    - Training
    - Supply Support
Why Worry About Supportability During Acquisition?

- Support costs are major component of total ownership cost
- Decisions made during acquisition drive support costs and availability
- Relationship between design and requirements for O&S resources
Typical TOC Composition

- Acquisition: 34%
- R&D: 2%
- Operations & Support: 64%
Total Ownership Cost

- R&D
- Production
- Operations & Support

  Design

  Logistics Functions
Major cost reductions in weapon system support require early recognition of supportability issues and opportunities.
Dependence of Availability on Design

- Availability
  - Reliability
  - Durability
  - Maintainability
    - Diagnostics & Health Monitoring
    - Documentation
    - Technical Data
    - Packaging, Handling, Shipping, Transportation
    - Facilities
    - Support Equipment
      - Maintenance
      - Manpower
    - Training
    - Supply Support

Design dependence
- Strong
- Weak
Why Use T&E to Assess Supportability?

- T&E is established as an integral part of the acquisition process
- T&E has gateways and check points for assessments of supportability
- ...at times when the insights can be used to affect cost & availability
Acquisition Timeline

DT & Contractor “OT”: Early insights on key issues

IOT&E: Gateway to full-rate production
Acquisition Process

IDEAL: Balanced consideration of TOC, readiness, performance, and risk

REALITY: traditional pressures on a program office - performance, schedule, and acquisition budget - work against consideration of O&S costs and supportability

*T&E is a key opportunity to gain insights about the first-order causal factors that drive costs and availability*
How Can T&E Be Used to Assess Supportability?

• Planning for TEMP - Extract supportability criteria from program docs and analogies.
• TEMP - Include all critical supportability issues
  – *Objective criteria* (e.g., RAM, BIT/BITE)
  – *Subjective judgement of the process* (T.O.s)
  – *Ensure supplemental demos and M&S activities are included to complement tests*
• Test plans for IOT&E, FOT&E - follow through
Acquisition Timeline

T&E Actions

- Review MNS, ORD
- Review DT&E Test Plan
- Review IOT&E Test Plan
- Review FOT&E Test Plan

Early & continuous testing
Identify Key Supportability Issues

- Supportability characteristics that will seriously degrade system availability or cost if they are deficient
- Risks associated with
  - *Technology applications*
  - *Support concepts*
  - *Operations concepts*
- Logistics resource drivers
Methods for Identifying Key Supportability Issues

<table>
<thead>
<tr>
<th>Document Review</th>
<th>Analysis</th>
<th>Modeling &amp; Simulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>List issues &amp; goals from system rqmts documents</td>
<td>Compare with other systems</td>
<td>Construct model of system, including ops &amp; support</td>
</tr>
<tr>
<td>Check for coverage of issues &amp; goals in TEMP</td>
<td>Review the elements of logistics support</td>
<td>Analyze the impacts of changes in ops &amp; support variables</td>
</tr>
<tr>
<td></td>
<td>Analyze relations among measures and assumptions</td>
<td></td>
</tr>
</tbody>
</table>
Review OT&E Plans

• Are all key supportability issues addressed through testing or M&S?
• Are the nature and the length of tests sufficient to judge with reasonable confidence?
• Are the M&S tools valid and are reasonable data and assumptions used?
OT&E Assessment

- Comprehensive with respect to key supportability issues?
- Major assumptions justified?
- Supportability problems that should receive corrective action?
- Supportability issues that require further T&E?
Summary

Supportability is key to weapon system success

Supportability depends on design

T&E provides a timely opportunity to develop supportability insights

Process and tools to evaluate supportability exist - Use them to improve acquisitions!