Turbine Engine Test & Evaluation for Development, Qualification & Sustainment:
Enhancing Ground Test Throughput

Glads and Sads of this project
SME January 28th Update
AGENDA

• Background
  - Overall project
  - Nine blocker
  - Customer Defined Value for Ground Test Throughput
  - EVMS events
    - EVMS Event Lessons Learned
• SME Sads and Glads for project
• Going forward
Turbine Engine Timeline – Current
Value of Test & Evaluation – Development & Sustainment (By: R.E. Smith, 8/5/03)

Air Veh. Reqm'ts
Technology Insertion
• IHPTET
• VAATE
• ATTEGG
• JTDE
• JETEC

CDA Air Vehicle
Prototype Prod.
A-V Reqm'ts
Wind Tunnel
Flt. Tst.
Tech Insertion

Tech Insertion

CDA Air Vehicle
Prototype
Eng. Reqm'ts
Rig Test
Static Test
Environ Test
Flight Test

Eng. Reqm'ts
FETT
IFR
1st Flt
CDR

Eng. Reqm'ts
Engine SD&D (E&MO)

Rig Test
Static Test
Environ Test
Flight Test

CDR
Eng Contr

1st A/C Deploy
AC Production & Deployment

CIPA
SUSTAINMENT

CDR
Eng Contr

DIOT & E
Low Rate Init. Pro & Deployment

1st Flt ISR
LRIP

FETT
IFR
1st Flt

HRP

CIP

*NOTE: CIP Tests Include
1) Rig Tests
2) Static Engine Tests (AMT, etal)
3) Environ. Eng. Tests (AMT, etal)
4) Pacer Aircraft (incl. ACI)
5) Field Service Eval. (FSE)

TURBINE ENGINE TEST & EVALUATION FOR DEVELOPMENT, QUALIFICATION & SUSTAINMENT
## Turbine Engine Development & Sustainment

### Prototype (Test and Evaluation Support Focus)

**Prototype Description:**
- Use an Propulsion Testing Enterprise Team (Air Force, Army, Navy, and Industry) to create value and eliminate waste in the engine development and sustainment process

**Preliminary Objectives:**
- Significant reductions in cycle time and cost for the testing process supporting the engine development and sustainment process

**Value:**
- Enhance support to multiple USAF weapon systems by
  1. Leveraging multi-center and industry sharing of best practices, common language, tool sets; and,
  2. Attacking key cycle times & drivers

**Process Information:**
- Focus upon test cost & cycle time reductions for engine RDT&E, DT&E, OT&E, & sustainment
- Access applicability of commercial engine test approaches, as well as revised DOD acquisition models

<table>
<thead>
<tr>
<th>Start Date:</th>
<th>10 June 2003</th>
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<tbody>
<tr>
<td>Team Leader:</td>
<td>Dr. Edward Kraft, AEDC</td>
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<td>Co-Leader:</td>
<td>Pete Chenard, P&amp;W; Tim Hillstrom, RR; Jim Wilson, GE</td>
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<td>Team Members:</td>
<td>See Attachment</td>
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<td>Process Owner:</td>
<td>Mr. Tim Dues, PPGM, OC-ALC</td>
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<td>LAI Lean Experts:</td>
<td>Ida Gall, P&amp;W; Doug Hottman, RR</td>
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<td>Case for Action:</td>
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  - The time and cost for development testing on today’s advanced engines are of the order of 10 yrs and $2.5B
  - The propulsion testing enterprise has not been examined from a lean perspective
  - Application of LAI principles should lead to significant reductions in time and cost |
Customer Defined Value for Ground Test Throughput

- Cycle Time Decrease
  +
- Cost Decrease
  or
- Engine Test Hours Increase
  +
- Engine Knowledge/Data Increase
  @
  Same T&E Costs
Glads from last EVMS Event

Glads\textit{(sample)}

- Sponsors Doing Outbrief
- Delivered Expectation
- Had the Right People
- Built Some Awareness of Areas That Need Work With Senior Leaders
- Created Impression That We Are Going to Drive Forward
- Developing a Standard Template for EVSM Event
- Design of Event Worked! Matured!
- Programmatic Implementation Was Briefed
- Great Knowledge Workers
- Pareto Approach Was Useful
- We Were Close Enough to Get Hard Data
- Good Engagement
- No Sacred Cows During the Week
Lessons Learned from last EVMS Event

Lessons Learned

- Use Examples to Clarify Objective for Each Module
- Need to Recognize Individuals
- “Value Added Document” Would Be Useful
- Map Out Your Process Ahead of Time
- Longer Day in Retreat Type Atmosphere
- Need More Mental Breaks
- Change the Structure of Sessions Around
- Have Design Re-enforce Comprehension of Waste
- More Data, More Chance to Get Data
- Need Strong Leadership From the Top
Timeline of project

- May 03 White Paper submitted
- June/July 03 Preliminary Planning meetings
- August EVMS event in Dayton
  - Arms around the project
- November 03 two more EVMS events at AEDC
- December 03 Buy in from Tim Dues on funding
- Four current projects on being reviewed on a weekly basis
- Upcoming training is being scheduled February 04
SME Glads of project

- Weekly telecoms a must…
- Good group of people interested in change…high cover still required to move the troops.
- Goal Defined…Reduce the “as is” amount of time for the tasks between the last run of the Trent until the first data run of the GP by 50%
SME Glads for project

- Need milestone charts/calendars

<table>
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<tr>
<th>TASK</th>
<th>MONTH</th>
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<tr>
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<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
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<tr>
<td>Planning</td>
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<td>Work Element Schedule Inputs</td>
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<tr>
<td>Boilerplate Schedule</td>
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<td>Load Pilot Program Data</td>
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<td>Update Schedule Daily</td>
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<td>Report Results</td>
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SME Sads for the project

- Lack of resources on all fronts
- Aggressive schedule
- Let’s do a study!
Going forward

- On going weekly telecons
- Refining funding process concern
- Training of additional resources as facilitators
- AEDC Project be part of the LAI Plenary March 04