LAI Vision Statement

“To significantly reduce the cost and cycle time for military aerospace products throughout the entire value chain while continuing to improve product performance.”
Today’s Introduction

- Workshop format
- Today’s theme
- Recent events
- Progress towards Phase II goals
- Workshop notes

(Team activity reports in binders)
## Plenary Workshop Format

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<tr>
<th>Day One - Oct. 14</th>
<th>Day Two - Oct. 15</th>
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<tr>
<td><strong>A.M. - General Session</strong></td>
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<tr>
<td><em>Keynote:</em> Rebecca Henderson</td>
<td><em>Keynote:</em> Ed Schein</td>
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<td>Sloan School</td>
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<td><em>The Value Stream</em></td>
<td><em>Industry Panel</em></td>
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<td><em>Lean Production Systems</em></td>
<td><em>Implementation Activities</em></td>
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<td><strong>P.M.</strong></td>
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<td><strong>Breakout Sessions</strong></td>
<td><strong>Focus Team Meetings</strong></td>
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<td>Four Tracks</td>
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<td>Break</td>
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<td><strong>Reception</strong></td>
<td><strong>Training Module Demo</strong></td>
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<td><strong>Dinner</strong></td>
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Value Stream Analysis

- Well developed for production applications
  - e.g. “Lean Thinking” by Womack and Jones
- Not well developed for activities “above the factory floor”
- Candidate definition for value stream:

The network of activities in which there is a continuous addition of product attributes including quality, functionality and usefulness, which directly address customer needs.
Lean Aerospace Initiative

**LEM Principles**

- **Meta Principles**
  - Waste Minimization
  - Responsiveness to Change

- **Enterprise Principles**
  - Right Thing at Right Place, Right Time, and in the Right Quantity
  - Effective Relationships within the Value Stream
  - Continuous Improvement
  - Optimal First Delivered Unit Quality

**OBJECTIVE IS TO ADD VALUE**
This Morning’s Plenary Session

Objective: learn more about value streams

- Introductions to value streams
  - Keynote talk
  - Introduction to Product Value Stream

- Presentations of value stream work in progress
  - F-22 Enterprise
  - Identifying the Product Development Value Stream

- Examples from production operations
  - Lean Production System Design
  - Implementing Lean Manufacturing at GE Engine Assembly
Recent Events

- **5 May Executive Board meeting outcomes**
  - Initiate planning for Phase III (Sep 99 - Aug 02)
  - Approved International Collaborations Policy and collaborations with
    - UK Lean Aerospace Initiative
    - Swedish Lean Aircraft Research Program
  - Consider roadmap for LAI interaction/integration with the Lean Sustainment Initiative
  - Approved policy recommendations on Cycle Time Reduction

- **New LAI Members**
  - Rockwell Collins
  - Aerojet Gencorp
Recent Events (Con’t)

- Labor Aerospace Research Agenda (LARA) project initiated
  - Research objectives
    - Quantifying the impacts of instabilities on the workforce
      - Changes in program funding
      - Changes in organization (merger, restructuring….)
      - Changes in technology
    - Identifying the diffusion of new work practices within and between organizations
  - Participants
    - MANTECH funded
    - UAW sponsored
    - IAM participation
    - MIT researchers
Phase II: Goals & Recent Progress

- Develop the LEM and populate it via benchmarking, case studies and research
  - 21 new data sheets from LAI findings
  - 38 new data sheets from external sources
  - Transition-to-Lean module development started

- Integrative research thrusts on cross-cutting topics:
  Concentrated efforts underway for:
  - Value stream analysis
  - Lean production system design
  - Integrated supplier networks
  - Requirements definition
  - Space operations and testing
Phase II Goals & Recent Progress
(Continued)

- Telling the LAI story
  - LAI Communications Toolkit debut

- Facilitating and enabling enterprise wide systemic change
  - Regional Supplier Workshops pilots
  - Policy recommendations on Cycle Time Reduction sent to OSD/A&T
  - Implementation workshop on “Flow Optimization Throughout the Value Stream”

- Extending and enhancing the collaborative nature of the project
  - Collaborative research projects initiated with UK & Sweden
  - Developing ties with Industrial College of the Armed Forces
  - Participation of ESC in Plenary Workshop & Executive Board
Workshop Notes

- Presentations available in the take-home notebook; and on our web site on or about Oct. 23, 1998
- A workshop evaluation included with materials
- On-site business services available – see registration area for details
- Team agendas for tomorrow can also be located in the registration area
- A list of scheduled meetings and room assignments is included in welcome packet
- Two scheduled breaks - central refreshment area outside this ballroom
- Reception with cash bar starting at 5:30
- LEM IPT dinner meeting at 6:30
- Finally, the bus back to the Cambridge Inn will depart at 6:40p.m. this evening - gather in lobby. It will leave from the Cambridge Inn tomorrow at 7:00a.m
Team Activity Reports
Activities

Establishing Software Requirements from System Requirements
Using Modeling and Simulation in Requirements Generation
Technology Insertion and the Product Development Process
Strategic Technology Investment Decisions

Products

Workshop + whitepaper: Product Development Value Stream

Plans

Effective Use of Process Capability Databases for Design
J- SR: Implementing Technology Throughout a Supplier Network

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<tr>
<th>MIT</th>
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<tbody>
<tr>
<td>Earll Murman</td>
<td>Ray Summers</td>
<td>Bob Deem</td>
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<td>Hugh McManus</td>
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**Factory Operations Focus Team**

**Activities**
- June Focus team meeting on the Lean Production System Design
- Development of a maturity matrix for lean production system design
- Airframe sector wing assembly study
- Schedule control policy experiment started

**Products**
- Lean production system design decomposition to focus team
- Maturity matrix for lean production system design
- Additional 10 LEM data sheets

**Plans**
- Conclude airframe sector research
- Expanded transition to production study
- Continue schedule control policy experiment

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<td>Tim Gutowski</td>
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<td>Bill Humphrey</td>
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<td>Tom Shields</td>
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Supplier Relations Focus Team

Activities
- Information systems for supplier integration (w/PD team & w/LARP)
- Make-buy and strategic outsourcing (w/LARP)
- Supplier coordination mechanisms
- Implementing world-class technology throughout supplier network
- Regional supplier workshops (w/USAF ManTech)

Products
- Innovation in product architecture through supplier integration
- LEM data sheets

Plans
- Comparative international benchmarking survey (w/UK LAI & LARP)
- Best practices in flowing down lean concepts throughout supplier stream
- Early supply chain design for robust transition to production

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<tr>
<td>Kirk Bozdogan</td>
<td>George Reynolds</td>
<td>Hamid Akhbari</td>
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<td>Charlie Fine</td>
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Activities

- Simulation model of cycle time cost and schedule control
- Lean user (needs and requirements definition) research (joint w/PD)
- Managing subsystem commonality research
- Developing research ties to the Center for Innovation in Product Development (CIPD) at MIT and the Industrial College of the Armed Forces (ICAF)

Products

- Master’s thesis on economic incentives in procurement
- Policy recommendations to DoD for cycle time reduction

Plans

- Continue research as indicated while exploring new opportunities with affiliated groups

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<tr>
<td>Wes Harris</td>
<td>Brad Gale</td>
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<td>Eric Rebentisch</td>
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Test & Space Operations
Focus Team

Activities
- Identifying and evaluating satellite integrated system test anomaly data
- Applying lean principles and value stream to spacecraft test
- Collection of launch failure data and looking at the implications of verification and validation approaches

Research products
- Evaluation of effectiveness of satellite integration system integration testing.
- LEM data sheets

Research plans
- Effectiveness of satellite system testing
- Launch operations evaluation
- Command and control approaches

MIT
Joyce Warmkessel
Ed Greitzer

Industry
Frank Goodell

Government
Art Temmesfeld
Research Activities

- Additional data sheets added to Web LEM 2.0
  - 21 LAI Research, 38 External
- Transition-to-Lean (TTL) Module development underway
- Pilot inclusion of external benchmarking and best practice data

Research plans

- TTL precedence diagrams, descriptions and linkage to LEM for enterprise and factory operations
- Enhancement of LEM architecture
- Updates to LEM from LAI research & external sources
Communications IPT

Activities
- May 98 Meeting and Site Visit w/ Aviation Week present
  - LMTAS, Ft. Worth, Raytheon Systems Co. Lewisville
- August 98 Meeting and Site Visit w/ Aviation Week Interviews
  - Raytheon Aircraft Co., Wichita KS

Products
- LAI Toolkit debut
- Constructed Exhibit Booth (as seen outside)
- Local communication products developed by team members

Plans
- Trade Shows and Expos - DMC Dec. 1998
- Second wave of products for Toolkit - success vignettes
- Team growth - space sector interests

MIT
Deneen Silviano

Industry
Don Cook
Bob Such

Government
Bob Reifenberg