

Genuine Learning: Aerospace Workforce Case Studies

“Racing Toward Knowledge: Get on Track with Lean”

A Lean Aerospace Initiative Learning Event

November 6-8, 2001

Hilton Charlotte & Towers – Charlotte, NC

➤ Objectives

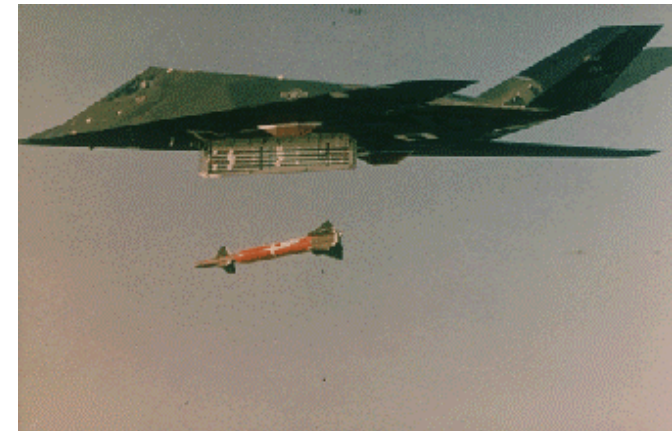
- Explore a teaching method designed to surface genuine learning on complex lean implementation and instability challenges
- Have fun, spirited dialogue
- Identify implications for practice and policy

➤ Design (3 hours)

- Welcome, Overview & Expectations (10-15 min.)
- Learning from Case Studies – Linked to Adult Learning Principles (15-20 min.)
- Case Study Overviews (15-20 min.)
- Small Group Analysis of Cases (20-30 min.)
- Break (15 min.)
- “Fishbowl” presentations (30-45 min.)
- Implications for policy and practice (30-45 min.)
- Concluding comments (10-15 min.)

Note: Additional participation in leading some of the discussions by IAM representatives at the workshop

Products Made by IAM & UAW Members

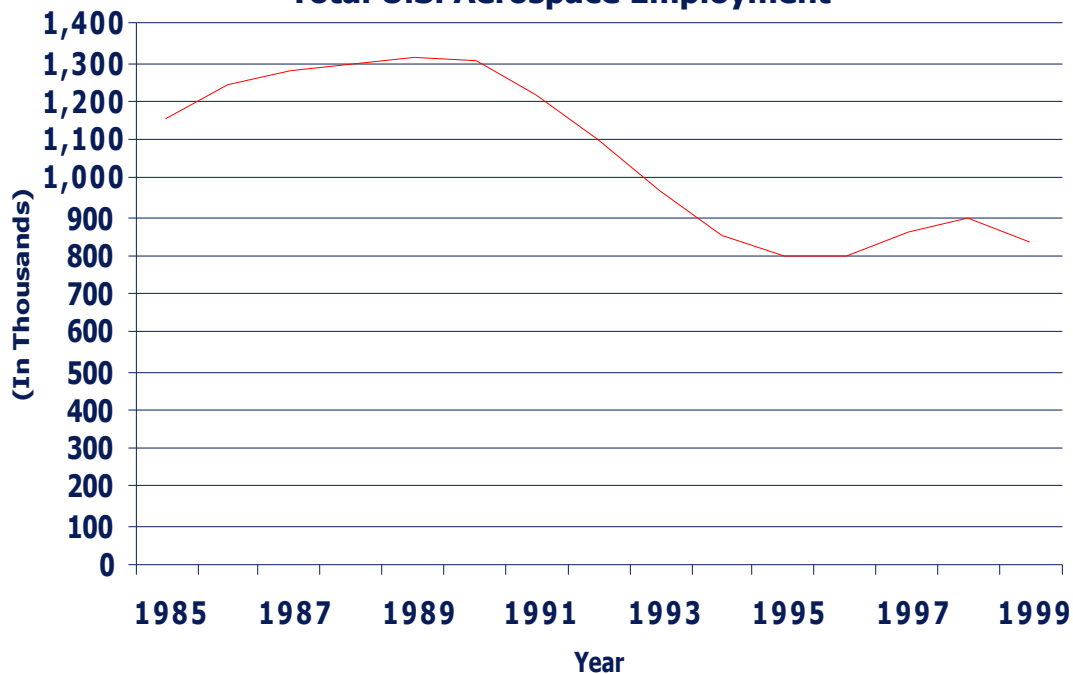


Introduction to Labor Aerospace Research Agenda

- Sponsor: **USAF ManTech**
- Lead Partners: **UAW and IAM**
- Principal investigators and Research Team:
 - **Tom Kochan (Co-PI), Joel Cutcher-Gershenfeld (Co-PI), Betty Barrett, Rob Scott, Takashi Inaba, Eric Partlan, Shannon O'Callighan, Kevin Long, and other team members**
- Links to LAI:
 - **Organizations and People, Knowledge Deployment, Other Research/Product Teams, and Curriculum Development**
- Funding:
 - **~\$300K/yr**
- Focus:
 - **Impact of instability on employment and workplace innovation in the aerospace industry**
 - **Human capital and institutional infrastructure**
- Methods
 - **National random sample survey (194 facilities)**
 - **Individual surveys (400+ surveys)**
 - **Case studies (6)**
 - **Collective bargaining contract analysis**
 - **Archival data analysis**

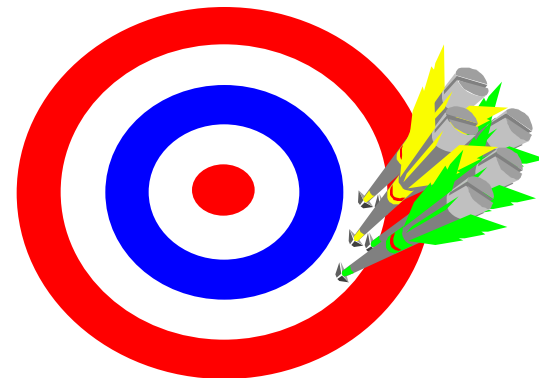
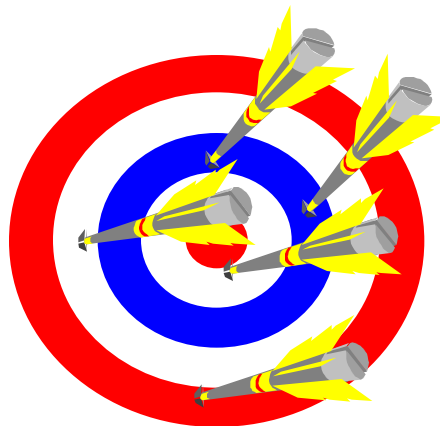
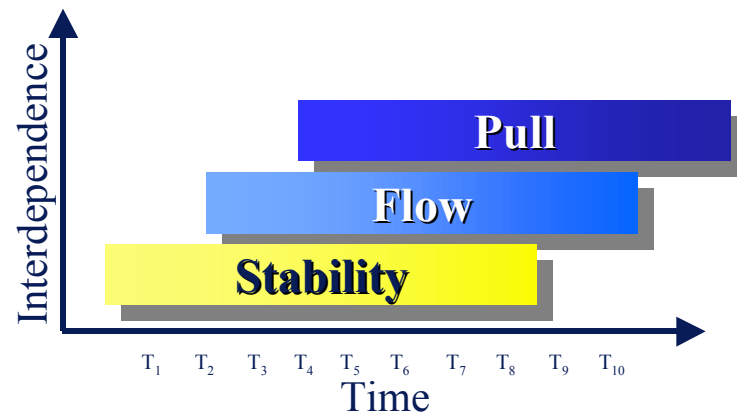
Why Worry About Instability?

Total U.S. Aerospace Employment



Source: AIA

Prepared by: IAM Strategic Resources Department



Lessons on Instability from Cases

➤ **Types of instability:**

➤ **Funding/orders**

- Shift from R&D to production funds
- Fluctuations in demand for primary product in facility

➤ **Technology**

- Changes in customer requirements
- Shifts in materials
- Rapid pace of change in computer capabilities)
- Environmental constraints

➤ **Organizational**

- Acquisition/layoffs
- Mergers/restructuring
- Relocation of products among facilities
- Two-tier relationship between sister facilities
- Demographics -- retirements/gaps in past hiring, skill shortages
- Turnover -- management, engineering, and hourly

Lessons From Cases (cont.)

- **Observed mitigation strategies:**
 - ***Business Strategy***
 - Increase proportion of commercial business sought
 - Shift in product mix to increase focus on space
 - ***Human Resource Management/Industrial Relations***
 - Cross-training/flexible utilization/teams
 - Informal no-layoff practice
 - Labor-management partnership
 - Employee involvement
 - Intensified training of hourly and salaried employees
 - Co-location of engineers, teams
 - Two-tier wage system
 - Multi-facility transfer agreements

Using Case Studies for Organizational Learning

➤ **Substance:**

- Case studies help us to “discover” knowledge – learning by studying other’s experience.
- Case studies provide an opportunity to practice with ideas and concepts – doing “what if” analysis.
- Case studies strengthen creativity and communication.

➤ **Process:**

- Use cases to create interaction.
- Cases enable individual and collective performances.
- Use cases to illustrate lessons or content.
- Allow enough time for exploration and discussion.
- Instructors take on an observer and a resource role.
- Develop targeted questions to stimulate learning.

Adult Learning Principles

- **Learners bring life experience**
 - The goal is not to “teach,” but to provide frameworks and exercises that provide new insights or perspectives into existing experience
- **People learn in different ways**
 - Provide a mix of presentation, discussion, exercises – with visual, auditory, and experiential learning
- **Lessons must be practical and useful**
 - Provide examples and drive the exploration of applications/implications – Keep the learning modules concise and appreciate other claims on people’s time
- **Learning should be fun and engaging**
 - Never use humor . . . Never ask people to analyze situations or data . . .

- ***Transformation Through Employee Involvement and Workplace Training: The Challenges of a Changing Business Context.***
- **Rocketdyne Propulsion and Power/UAW, Canoga Park, California, 1999 – by Takashi Inaba and Betty Barrett.**
 - This case looks at organizational change, funding and environmental concerns that occurred as the company shifted its focus from the military to the commercial. After its acquisition by Boeing in 1996, it developed a vigorous employee involvement program. EI and workforce training were the two key mechanisms to mitigate instability. 120 EI groups developed plus six self-directed teams. Negotiated between the UAW union and Rockwell International in 1990, the EI program creates an opportunity to say how work is done, which represents an important culture change occurs. Leadership skills are just as important to success are are technical skills. Rocketdyne is still faced with organizational and cultural change challenges, though the growth in the space sector should be helpful relative to other parts of aerospace.

Engine Sector: HPWO and Strategic Decisions

- ***Fostering Workplace Innovation and Labor-Management Partnership: The Challenge of Strategic Shifts in Business Operations.***
- **Pratt & Whitney (United Technologies)/IAM Local Lodge 971, West Palm Beach, Florida, 1999 – by Betty Barrett.**
 - The closing of the military jet engine side of the facility and laying off of more than half of the workforce was an unanticipated form of instability faced in this case. The study had begun in order to document innovations between the IAM local and local area management centering on establishing a team-based work system and joint training systems. While important as innovations, these efforts did not convince Connecticut managers to maintain the work in this location. Ultimately, neither local union or local management efforts were sufficient to overcome the instability associated with broad corporate strategies around the movement of work.

Airframe Sector: HPWO, Lean and ABC

- ***Boeing Corporation: From Three to One. Integrating a High Performance Work Organization Process, Lean Production and Activity Based Costing Change Initiatives.***
- **Boeing, Wichita, Kansas/IAM, 2000 – by Tom Kochan.**
 - **In 1997, Boeing and IAM launched an HPWO after introducing lean production initiatives in 1994 and Activity Based Costing (ABC) in 1996. Management and union leaders wanted to empower the workforce and enhance the competitiveness of the operations. After a slow and difficult path of diffusion, they need to decide how to best integrate these separate improvement programs into a single initiative. Boeing's engineering culture needs to work with the pragmatic workforce in Wichita. Workers fear losing products and projects to other Boeing facilities and have concerns about leadership turnover and follow-through. The HPWO helped managers recognize the importance of unions. Still, all three initiatives need a broader base of support.**

Airframes Sector (cont.): Activity Based Costing

- ***Employing Activity Based Costing and Management Practices Within the Aerospace Industry: Sustaining the Drive for Lean.***
- **Boeing Commercial Airplane Group, Wichita Division/IAM, Wichita, Kansas, 1999 and 2000 – Betty Barrett, Rocko Paduana, and others**
 - ABCM is an accounting tool that can help companies recognize true costs and make critical choices. ABCM is designed to help firms shift their priorities from individual products to the overall manufacturing environment. BCAG is the world's largest manufacturer of commercial airplanes. It is crucial to move the corporate financial department from account role to that of business partner. The ABCM model organizes activities in terms of their relationship to final cost objects. Looking at two pilot studies, this case study shows the benefits that can be reaped from ABCM implementation. The IAM has supported the adoption of ABCM as a way to get at the true costs of production. There is caution, however, that ABCM is not a panacea.

Avionics and Systems: Continuous Improvement & Lean

- ***Fostering Continuous Improvement in a Changing Business Context.***
- **Textron Systems, Wilmington, Massachusetts, 1998, 1999, 2000 – by Joel Cutcher-Gershenfeld.**
 - **This is a large non-union facility implementing systems change initiatives in a rapidly changing business context. Textron has been an important contributor to the U.S. defense aerospace business for five decades. Textron is a prime contractor with the U.S. government and supplier for other technologies. Textron sees workplace change initiatives as key to business success. It seeks performance gains through employee training and development. Textron Systems illustrates the ever-changing challenge of aligning employment systems with business strategy in the aerospace industry. It can sustain major change initiatives and is vulnerable to the swings that come with each new business contract. A combination of training, organizational development and work restructuring activities are being implemented. Even so, they cannot fully mitigate the instability associated with the defense aerospace sector.**

Multi-Program Enterprise: Joint Training

- ***A Decade of Learning***
- **International Association of Machinists/Boeing Joint Programs, 2001, Seattle, Washington – by Tom Kochan.**
 - **This national joint training initiative, funded at 14 cents per payroll hour worked, represents a key institutional innovation. Negotiated under Article 20 of the contract, this program has evolved over its first decade of experience. It expands life long learning to nearly all hourly workers. Major components of the program include: Layoff and Redeployment assistance, The Health and Safety Institute; Career and Personal Development; Classroom Training; Personal Enrichment, and High Performance Work Organization (HPWO). After a decade, the joint programs have reached between 40 and 50% of bargaining unit employees. Lean initiatives at Boeing are largely separate from the National Joint Training programs. The joint training programs have attractive design features and a steady stream of funds – so perhaps they should be more tightly linked. The program is jointly governed and staffed and thereby provides shared ownership from management, the union and the workforce. Its full potential will only be realized, however, when line managers see it as a core resource.**

A Call to Action: LAI Executive Board

- **Dimensions of an employment crisis in Aerospace:**
 - **Increasing skill shortages**
 - Changing skill mix in a post-cold war era
 - Reduced investment in training and development
 - **Divisive and immobilizing concerns over job security**
 - Industry has lost over 500,000 jobs since 1990
 - **Demographic “cliff”**
 - Average age of IAM members is 44 in the Commercial Sector and 53 in Defense – with over 20% eligible to retire in next 3 years
 - **Global competitive dynamics**
 - Projected loss of jobs and revenue due to increased global competition
 - Projected increase in foreign content – with complex implications
 - Projected job growth in European Aerospace Industry
 - **Inability to attract and retain a 21st Century workforce**

Learning Model Developed in Workshop

*Acquiring new business
(bear hunting)*

*Delivering on business commitments
(Bear catching)*

