



# *Continuing the Lean Journey*

**Major Ron Jobo, USAF**

**Affordability and Lean IPT Lead**

**Global Hawk System Program Office  
Wright-Patterson AFB, OH**

**[ronald.jobo@wpafb.af.mil](mailto:ronald.jobo@wpafb.af.mil)**



**U.S. AIR FORCE**

---

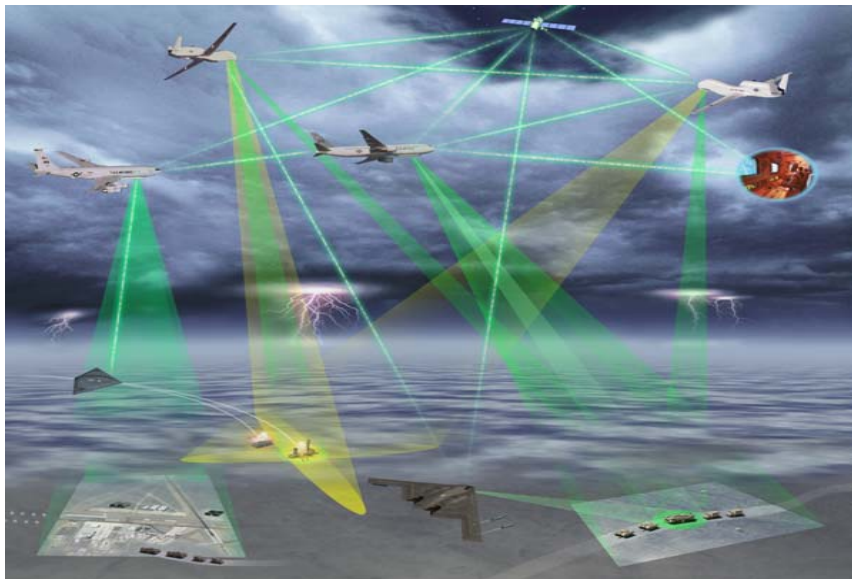
# ***Presentation Outline***

- **Introduction to the Global Hawk program**
- **Global Hawk participation in “Lean Now”**
- **Continuing the lean movement and promoting lean within the AF System Program Office**
- **Pitfalls and Misconceptions of lean**



U.S. AIR FORCE

# USAF Global Hawk – ISR Mission



- **Capability – Provide Multi-INT Persistent Surveillance**
- **EO/IR/SAR and SIGINT**
- **Platform-to-Platform Cross-cueing via Network Centric Ops**
- **Integrated with Manned, Unmanned and Overhead Systems**
- **Range Half Way Around the World**
- **On Station for Extended Periods**
- **Advanced Technology Sensor for Dominant Information Awareness**

# Global Hawk Capabilities By Spiral

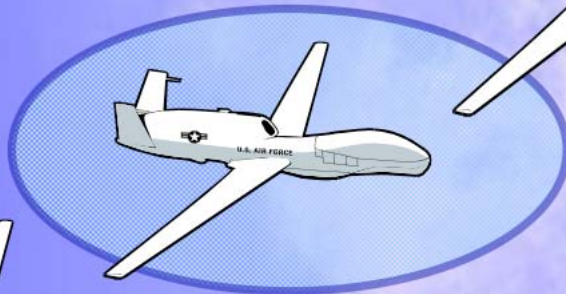
## Advanced Concept Technology Demonstration (ACTD) provided strong foundation of capabilities:

- Autonomous flight control system
- Long-range, long endurance airframe
- Hi-resolution, precision multi-sensor payload
- Limited ground moving target indication
- Manual RF cueing to radar emitters



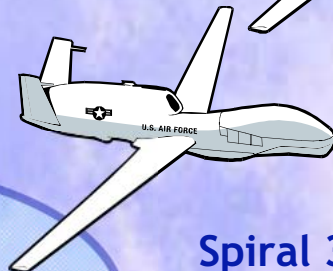
### Spiral 1: Operationalize Existing System

- World-wide operating capability
- Sustainable support system



### Spiral 2: Core "Truck"/Open Architecture

- Expanded IMINT, initial SIGINT
- Near horizon standoff range
- Baseline NAVY variant



### Spiral 3: Full-spectrum SIGINT

- Signals Intelligence to support mid-scale engagements
- Machine level horizontal integration capable
- Defensive threat awareness
- Open System Architecture



### Spiral 4: Improved Radar

- Improved range and resolution
- Track quality ground moving target identification
- Airborne surveillance capability
- Enhanced airspace operations and survivability
- Potential Navy variant



### Spiral 5-6: Full-spectrum operations

- Full horizontal integration
- Expanded communications
- Extreme environment / NBC ops



U.S. AIR FORCE

---

# Global Hawk Major Stakeholders

***NORTHROP GRUMMAN***

*Integrated Systems*



U.S. AIR FORCE

**Raytheon**



**communications**





**U.S. AIR FORCE**

---

# ***Global Hawk “Lean Now” Initiative***

- **Global Hawk was chosen as one of three AF “Lean Now” prototype programs – Oct/Nov 2002**
  - **“Lean Now” initiative focused on “interfaces” between the government and its industry partners**
  - **Concept of lean was new to the SPO**
  - **Northrop Grumman (NG) had a lean infrastructure in place but focused internally**
  - **“Lean Now” opened the dialogue between government and industry**
-



**U.S. AIR FORCE**

# ***Global Hawk Lean So Far...***

- 
- **CY2003 Year End Event Summary (18) Major Initiatives**
    - ISS Event Raytheon – Lean Now – December 2002
    - LAI Lean Now Workshop Training – January 2003
    - ICS Event L-3 Communications – Lean Now – January 2003
    - Enterprise VSM – Lean Now – February 2003
    - Alpha Contracting – Lean Now – February 2003
    - Engineering Scheduling – Global Hawk – March 2003
    - Aurora Aft Fuselage VSM – Lean Now – May 2003
    - Supplier NCTP Process – Global Hawk – May 2003
    - Production VSM – Lean Now – May 2003
    - Employee Processing – Global Hawk – June 2003
    - Change Process – Global Hawk – June 2003
    - EAFB Flight Test 5 S – Global Hawk – July 2003
    - LESAT Process Overview Kickoff – Lean Now – August 2003
    - Eng. Development VSM – Global Hawk – August 2003
    - Engineering Document Release Process – Global Hawk – September 2003
    - UCA Baselineing – Global Hawk – October 2003
    - Purchase Requisition – Global Hawk – November 2003
    - Begin SPO IPT Process Reviews – December 2003
-



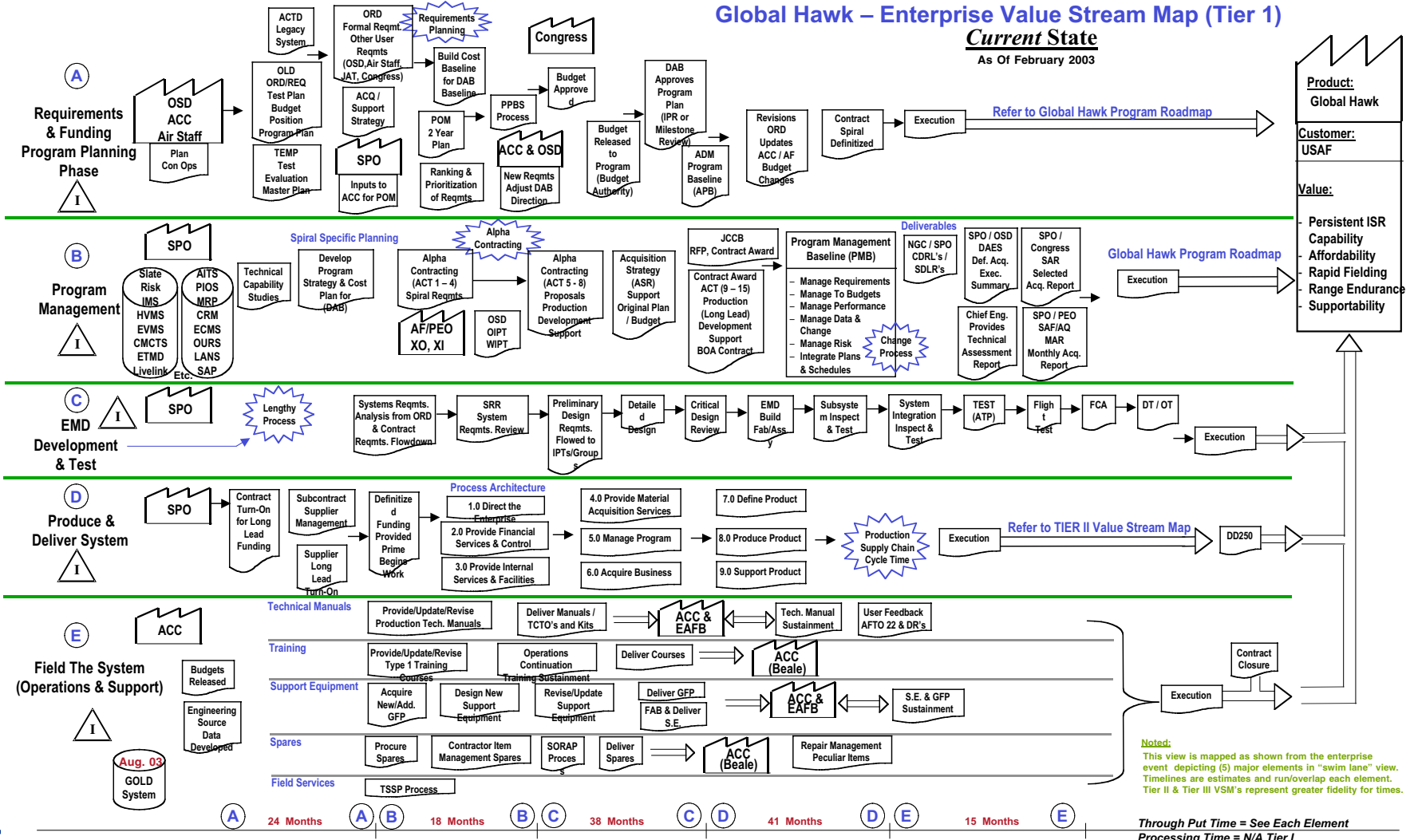
U.S. AIR FORCE

# Global Hawk Enterprise Value Stream Map

## Global Hawk – Enterprise Value Stream Map (Tier 1)

**Current State**

As Of February 2003



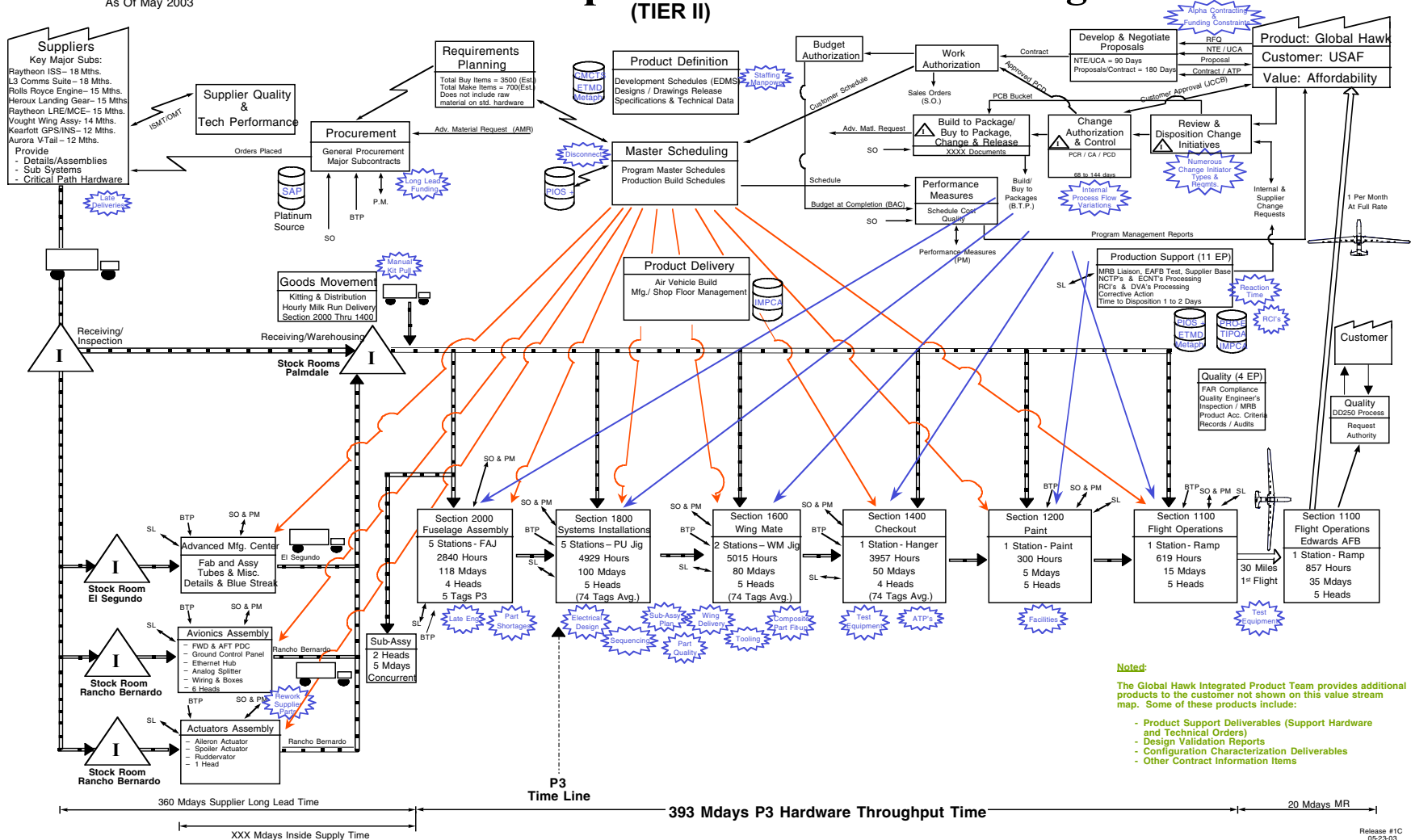


U.S. AIR FORCE

# Global Hawk Production Value Stream Map

**Current State**  
As Of May 2003

## Value Stream Map View Global Hawk Program (TIER II)



**Notes:**  
The Global Hawk Integrated Product Team provides additional products to the customer not shown on this value stream map. Some of these products include:

- Product Support Deliverables (Support Hardware and Technical Orders)
- Design Validation Reports
- Configuration Characterization Deliverables
- Other Contract Information Items



U.S. AIR FORCE

# ***Global Hawk "Lean Now" Major Accomplishments***

## **Supplier Focused Events**

- Raytheon
  - \$49M Savings for ISS Deliveries
  - Increased Units from 3 to 6 per Year
- L-3 Communications
  - \$33.8M Savings for AICS/GICS Deliveries
- Aurora
  - Aft Fuselage 42 Day Cycle Time Gain P3

## **Enterprise Value Stream Mapping**

- Completed Tier I Enterprise VSM – Feb. 03
- Updated Tier II Production VSM – May 03
- Supplier VSM's for Raytheon, L-3, Aurora
- Eng. Development VSM – Aug. 03
- Process Level Value Stream Maps
  - Alpha Contracting
  - Change Process

## **Cycle Time Reductions**

- Alpha Contracting
  - 37% Initial Reduction of 5 Months
- Change Process
  - 63% Reduction from 95 to 35 Days
- Production Delivery Cycle
  - 38% Reduction per Schedule BL-10
- Supplier Delivery Reductions Documented

## **Significant Goals Achieved**

- Completed 10 Major Events
- Enterprise Collaboration SPO/NG/Suppliers
- Continuous Improvement VSM's In Place
- 97% Award Fee Customer Rating for Affordability Supported by Lean Now Events
- Additional \$5M Opportunity Savings for Identified Production Producibility Initiatives
- Joint SPO / NG LESAT Completed



U.S. AIR FORCE

---

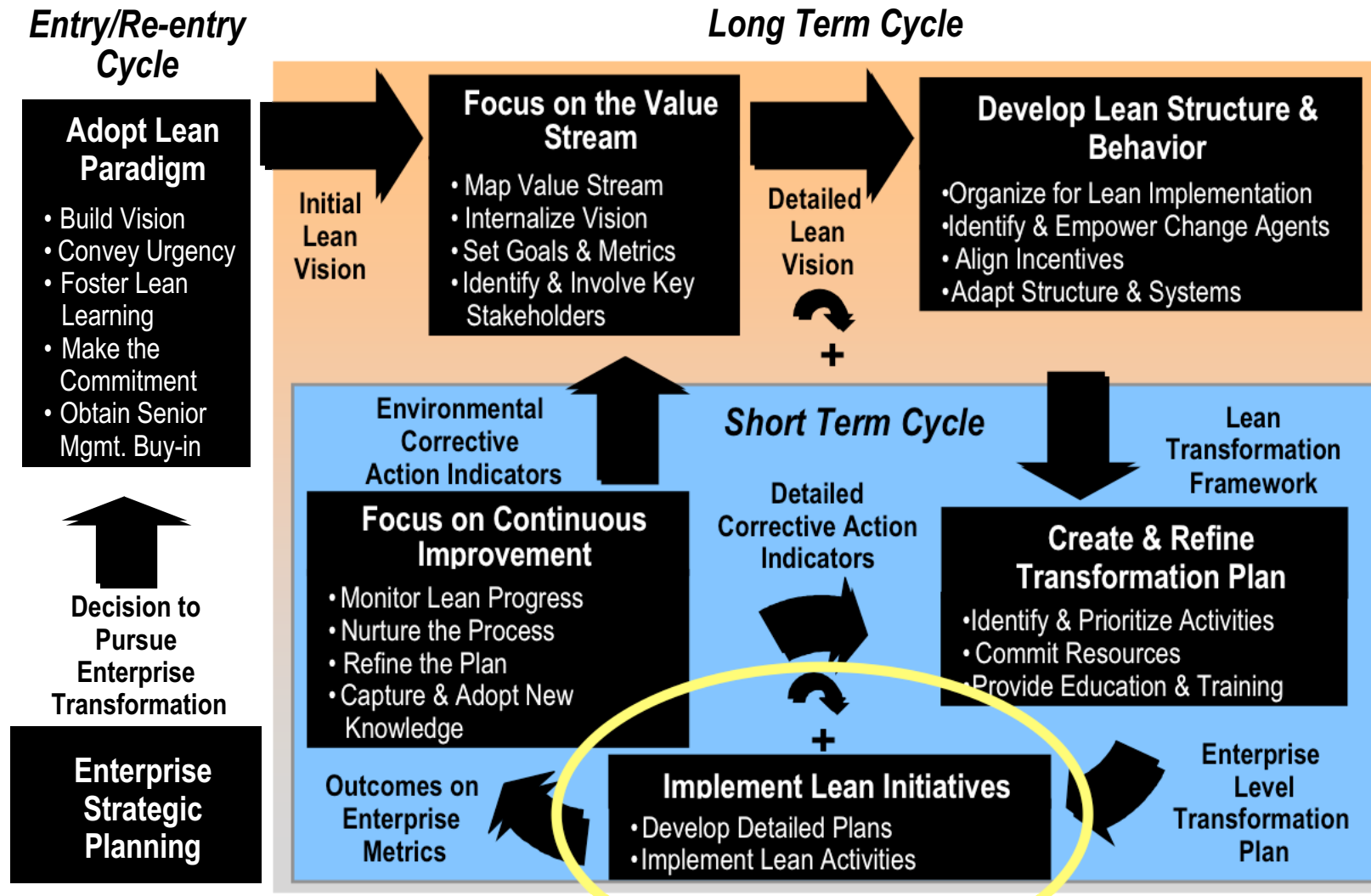
## ***“Lean Now” Post Mortem***

- **“Lean Now” showed what is possible when government and industry work together**
- **Successful “Lean Now” initiative doesn’t mean we’re lean**
- **A lean enterprise implies lean stakeholders**
  - NG already on the journey to lean
  - GH SPO needs to address the others steps of the TTL Roadmap
- **Primary focus of “Lean Now” was on the “Implement Lean Initiatives” phase of the Transition to Lean (TTL) Roadmap**
  - Need to add further focus on other areas of the TTL Roadmap



# Transition-To-Lean (TTL) Roadmap

U.S. AIR FORCE





**U.S. AIR FORCE**

# ***What is the SPO approach to meet the Long Term Objectives?***

---

- **Continue to promote the lean enterprise**
    - Continue to encourage NG lean initiative
    - Encourage NG to have lean subcontractors
    - Focus on interfaces and enterprise-wide processes
    - Build relationships between stakeholders
    - Establish a Lean Community of Practice
    - Develop joint tactical and strategic lean roadmap
  
  - **Apply lean within the SPO**
    - Identify a lean lead for the SPO
    - Examine internal organization and processes
    - Continuous learning through lessons learned and training
-



U.S. AIR FORCE

# ***Global Hawk Enterprise 2004 Objectives***

---

- **Value Stream Mapping: Update VSM's / Create New**
  - Support Program Strategies for Continuous Improvement
- **Key Processes: Alpha Contracting**
  - Achieve 50% Throughput Cycle Time Reduction
- **Supplier Focus: Implement Strategic Engagement**
  - Improve Quality, Affordability, Deliveries, Lean Training Development, & Establish SME Community for Supply Chain
- **Establish Flow on Global Hawk: AOP Tactic Goal**
  - Implement Production Flow to meet Customer Takt Time
- **Develop 5 Year Lean Roadmap: LEAN Framework**
  - Increase Enterprise Operational Efficiencies, and Value

***NORTHROP GRUMMAN***  
*Integrated Systems*

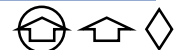
---



U.S. AIR FORCE

# Global Hawk Enterprise 2004 Project Roadmap

Activity	2004											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>1. Value Stream Mapping</b> - Update VSM - Create New - 5 Year Roadmap	Perform Value Stream Mapping / Update Existing Maps + Future State / Create New VSM's / 5 Yr. Roadmap											
	Enterprise VSM		Development VSM			Production VSM						
	Ground Segment VSM			Key Suppliers			Logistics / Beale AFB			Roadmap Approval		
	Develop 5 Year Lean Roadmap											
<b>2. Key Processes</b> Alpha Contracting Eng. Development Change Process	ETP Phase II Event Plan											
	ACT Kaizen Events / Targeted 50% Key Process Cycle Time Reduction Goal											
	Eng. Development Follow On			Change Process Follow On								
<b>3. Key Suppliers</b>	Aurora Raytheon					Develop SME Community			Conduct 3 Key Supplier Events			
<b>4. Kaizen Events</b> - Annual LESAT	5-S Uniformity Team											
	Work LESAT Gap Analysis Plans					Perform Kaizen Events / Establish Flow on Global Hawk						





**U.S. AIR FORCE**

---

# ***Global Hawk SPO Lean Objectives***

- **Lean has been incorporated into the umbrella of the Affordability Program**
    - Use lean to find the best value for all stakeholders
  
  - **Reduce Life Cycle Costs through efficiencies and process improvements**
  
  - **Increase communication effectiveness and relationships between SPO, contractors, and ACC**
  
  - **Enhance SPO effectiveness**
    - Review SPO process/structure
    - Fine tune IPT processes and interactions
    - Increase cross-talk between IPTs and personnel
-



U.S. AIR FORCE

# ***Global Hawk Process Improvement Way Ahead***

---

- **Assigned a SPO lean lead**
    - Promote lean internally and externally
    - Lead lean events and initiatives
  - **Use Government LESAT results to identify focus areas**
  - **Refine internal SPO processes**
    - Government LESAT used to identified opportunities
    - Reduce confusion – improve communications
    - Identify Roles and Responsibilities
    - Examine existing processes
    - Document processes
  - **Continuous education**
    - Promote “thinking out of the box”
    - Educate workforce on principles of change
-



U.S. AIR FORCE

# ***Global Hawk Process Improvement Way Ahead (con't)***

---

- **Capture Lessons Learned**
  - Promote the use of Lessons Learned to learn from past activities
- **Established SPO Database Library**
  - Use of database to promote SPO knowledge sharing
  - Responsibility matrix
- **Continue to promote Enterprise-wide Thinking**
  - Continue SPO/Contractor lean events
  - Establish a “Lean Council” between SPO/NGC/Subs
  - Strategic view of Lean (5-year Plan)
  - Revised GH Team Norms



**U.S. AIR FORCE**

---

## ***Global Hawk Team Norms - 3-3-04***

- **Establish Trust Through Building Relationships**
  - **Be a Contributor not a Critic**
  - **Always Develop Win Win Solutions**
  - **Take Joint Ownership and Accountability in Products and Issues**
  - **Seek First To Understand, Then Be Understood (Listen)**
  - **Open and Timely Sharing and Responsible Use of Information**
  - **Relentless Commitment To Excellence**
  - **Take Time to Plan, Innovate, and Improve  
(Become a Learning Organization)**
  - **Continuously Provide Two Way Feedback**
  - **Provide Recommendations When Presenting Problems**
  - **Help Others to Excel**
-



U.S. AIR FORCE

## *Recent, On-going, and Planned Activities*

---

- **Aurora Lean Training (16 Feb 2004)**
  - **Ground Segment Lean Event (Feb-Mar 2004)**
  - **SPO IPT Reviews (On-going)**
  - **Alpha Contracting (April 2004)**
  - **Logistics Lean Event (Spring 2004)**
  - **GH Library Database Development (On-going)**
  - **Closing out and follow-through of past lean events (On-going)**
  - **GH Lean Community of Practice -- SPO, NGC, and subs**
  - **Lean Training Module for New Comers Briefing**
  - **Combining NG and SPO LESAT results (TBD)**
-



U.S. AIR FORCE

---

## ***Pitfalls and Misconceptions...***

- **Thinking of lean as a tool rather than a commitment to continuous improvement**
    - Results in inconsistencies and suboptimization
  - **“We can’t do that because...”**
    - Improvement means taking risks and challenging the status quo
  - **“Lean should be free”**
    - Lean requires resources and sometimes requires substantial investment
  - **“Personality driven”**
    - Infrastructure is required to endure leadership changes
  - **“All talk and no action”**
    - Too much analysis and planning and not enough action
-



U.S. AIR FORCE

---

## ***Pitfalls and Misconceptions (con't)***

- **“The Spanish Inquisition”**
  - Using lean events as a threat
  - Lean becomes an activity rather than a philosophy
- **Lack of patience**
  - Change doesn't happen over night
- **Overuse of the word “lean”**
  - Lean becomes a buzzword
  - Little understanding of what lean is
- **Reinventing the Wheel**
  - No capture and/or use of lessons learned



U.S. AIR FORCE

---

## *Conclusions*

- **“Lean Now” provided enthusiasm and publicity for the possibilities of lean**
- **Success of “Lean Now” is no indicator of a successful paradigm shift**
- **Self-sustaining lean requires a proactive and dedicated approach and a solid foundation – “an infrastructure for change”**