Re-Forming the DoD Acquisition Process

A Systems Engineering Approach

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DISCLAIMER

OVERVIEW

• CURRENT DoD 5000 MODEL
• FAA CERTIFICATION PROCESS MODEL
• PROPOSED AIRCRAFT ACQUISITION MODEL
Current DoD 5000 Model
All Systems

A
Concept Refinement
Concept Decision

B
Technology Development

C
System Development & Demonstration
Design Readiness Review

IOC
Production & Deployment
FRP Decision Review

FOC
Operations & Support

SRR  PDR  CDR  PRR
Current DoD 5000 Model
All Systems

• **ADVANTAGES**
  – Framework allows flexibility
  – Easily tailored for specific program requirements
  – Allows for Technology Development prior to SDD phase

• **DISADVANTAGES**
  – Most risk is on acquisition agency for development
  – Capability and certification requirements are not integrated
  – Certifications can have significant impact on program cost and schedule
Commercial Development Process

Program Definition

Program Approved

Certification Basis Established

Design, Develop and Certify

Produce
FAA Certification Process

- FAA process is regulatory - Type certification requirements are must dos
  - In DOD airworthiness requirements are not even Key Performance Parameters
- Customers involved in creating requirements - Notice of Proposed Rulemaking
  - No buy-in by customers on DoD airworthiness criteria
- Type cert board establishes criteria up-front
  - Includes compliance method
  - Done prior to design and test phase
- Cost/schedule of compliance is better known up-front
  - DoD criteria are not fully agreed to until after cost established
- Type certification drives significant cost to a commercial program
  - AF 516B drives cost but those costs are unknown at contract award
- There is a known process in place to certify components - Technical Standards Orders Database
- Independent organization verifies compliance
FAA Certification Process

• ADVANTAGES
  – Proven safety track record
  – Well understood cost and schedule
  – Total requirements set known at program approval
  – Early planning for validation minimizes risk

• DISADVANTAGES
  – Little consideration for cost of ownership
  – All development risk is on the airframe developer
    • Design influenced by available, mature technology
Proposed Model
Aircraft Systems

- Concept Refinement
- Technology Development
- Technology Maturation & System Design
- System Integration & Certification
- Production & Deployment
- Operations & Support

Key Milestones:
- SRR (System Readiness Review)
- PDR ( Preliminary Design Review)
- CDR (Critical Design Review)
- PRR (Preliminary Review of Risk & Readiness)

Phases:
- IOC (Initial Operating Capability)
- FOC (Full Operational Capability)
Proposed Model
Aircraft Systems

• Milestone A - Technology Development
  – Entry criteria
    • Technology Development Strategy
    • Initial Capabilities Document
  – Contract type – Cost Plus/Award Fee
  – Timeline/Schedule
  – Integrated Risk Assessment
Proposed Model
Aircraft Systems

• Milestone B - Technology Maturation and System Design
  – Entry criteria
    • SRR
    • Capabilities Description Document
    • Certification Plan
  – Contract type – Cost Plus/Incentive or Award Fee
  – Timeline/Schedule
  – Integrated Risk Assessment
Proposed Model Aircraft Systems

• Milestone C - System Integration and Certification
  – Entry criteria
    • CDR
    • Capabilities Production Document
  – Contract type – Fixed Price/Incentive Fee
  – Fixed Timeline/Schedule
  – Integrated Risk Assessment
Proposed Model
Aircraft Systems

• Milestone D - Production
  – Entry criteria
    • PRR
    • System Certification
    • Successful Initial Operational Test & Evaluation
  – Contract type – Fixed Price/Incentive Fee
  – Timeline/Schedule
  – Integrated Risk Assessment
# Proposed Model
## Aircraft Systems

<table>
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<tr>
<th>ADVANTAGES</th>
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<tr>
<td>Integrates systems engineering events with acquisition milestones</td>
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<td>Integrates capability and certification requirements</td>
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<td>Utilizes a known development/certification process</td>
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<td>Allows risk-based management of resources</td>
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<td>Provides Time Certain certification – similar to FAA</td>
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<td>Similarity to FAA cert encourages broader business base</td>
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<th>DISADVANTAGES</th>
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<td>Increases the number of Defense Acquisition Boards</td>
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Summary

- Current acquisition process has room for improvement

- Requirements and acquisition processes need to be better integrated

- Program risk can be reduced through better alignment of acquisition milestones and systems engineering events