Software Acquisition Best Practices for Ground Systems

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The Big Issues and Challenges in Acquiring Ground Systems

Software!

Executability

Mission Assurance
### Example DoD and NSS Acquisition Models
Tailored for Software-Intensive Systems without Production

#### NSS Space Acq Policy 03-01 (Adapted)

<table>
<thead>
<tr>
<th>Pre-Systems Acquisition</th>
<th>Systems Acquisition</th>
<th>Sustainment</th>
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<tr>
<td>PHASE A Approval</td>
<td>PHASE B Approval</td>
<td>1st Launch</td>
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<td>PHASE B Approval</td>
<td>PHASE C Approval</td>
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<td>PHASE C Approval</td>
<td>Build Approval</td>
<td>Upgrade Decision</td>
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<tr>
<td>Design Readiness Review</td>
<td>Follow On Buy Approval</td>
<td>FOC</td>
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#### Key Decision Points:
- Pre KDP-A Concept Studies
- PHASE A Concept Development
- PHASE B Preliminary Design
- PHASE C Complete Design
- PHASE D Build & Operations

#### Milestones:
- IOC
- FOC
- Limited Deployment Approval
- Full Deployment Approval

#### Concept Decision

**Milestones:**
- Technology Development Approval
- System Development & Demonstration Approval
- Design Readiness Review

**DoDI 5000.2 (12 May 2003) (Adapted)**
Reducing Space System Acquisition Risk with
Software Acquisition Best Practices

NSS Space Acq Policy 03-1

Pre-Systems Acquisition | Systems Acquisition | Sustainment

Key Decision Points:

- Pre KDP-A Concept Studies
- PHASE A Approval
- PHASE B Approval
- PHASE C Approval
- 1st Launch
- IOC
- FOC

PHASE A
- Concept Development
- PHASE A Approval

PHASE B
- Preliminary Design
- PHASE B Approval

PHASE C
- Complete Design
- PHASE C Approval

PHASE D
- Build & Operations

Contractor Capability Evaluation

Software-Exclusive System Requirements

Software-Exclusive System Architecture

Robust Software Architecture

Realistic Software Size, Cost and Schedule Estimates

Key Software Technical and Management Deliverable Data

Software-Inclusive Technical Reviews

Contractually Compliant Software Standards

Robust Software Test Program

Pro-Active Quantitative Management

Software Product & Process Risk Reduction

Software-Inclusive System Requirements

Software-Inclusive System Architecture

Reduction of Software Risk Through Pro-Active Quantitative Management and Software Product Risk Reduction
Software Acquisition “Best Practice” Contract

**SOW**
- Comply with SDP
- Do COTS SW trade studies
- Hold SW technical reviews
- Undergo periodic software process appraisals

**Contract Reqs**
- Software-inclusive system requirements
- COTS software support requirements

**Deliverable Data**
- Software plans
- Reqs & architecture
- Test documentation
- Metrics reports
- O&M documentation

**Special Provisions**
- Electronic access to all software products
- Access to prime & subcontractor software technical & mgmt data

**Compliance Docs**
- Full life cycle software standard
- Other software-related standards

**Award Fee Plan**
- Software quality
- SW architecture for evolution and legacy transition
Best Practices that Span the Acquisition Life Cycle

Software Acquisition Risk Management
Software Systems Acquisition

- **Continuous software acquisition risk management**
  - Across the entire acquisition life cycle
  - Program level risk management and contractor development risk management are necessary but not sufficient

- **Integrate** software acquisition with the system acquisition process
  - From capability needs identification through system retirement
  - Especially during early life cycle and pre-contract award activities
Conclusion

• **Software acquisition best practices do not guarantee success**
  ❖ They are not a panacea!

• **Using best practices, however, can reduce risk** in complex software-intensive ground system acquisitions
References


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<tr>
<td>CDR</td>
<td>Critical Design Review</td>
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<td>Full Operational Capability</td>
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