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)

Key Decision Points:
- PHASE A Approval
- PHASE C Approval
- Build Approval
- 1st Launch
- IOC
- FOC

Pre-Systems Acquisition
- Pre KDP-A
  - Concept Studies
- PHASE A
  - Concept Development
- PHASE B
  - Preliminary Design
- PHASE C
  - Complete Design
- PHASE D
  - Build & Operations

Sustainment
- Upgrade Decision
- FOC

Systems Acquisition
- Milestones:
  - IOC
  - Follow On Buy Approval
  - Limited Deployment Approval

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

Pre KDP-A

PHASE A Concept Development
- SRR
- SDR

PHASE B Preliminary Design
- PDR

PHASE C Complete Design
- CDR

PHASE D Build & Operations

Contractor Capability Evaluation

Software Product & Process Risk Reduction

Software-Inclusive System Requirements

Software-Inclusive System Architecture

Robust Software Architecture

Realistic Software Size, Cost and Schedule Estimates

Key Software Technical and Management Deliverable Data

Software-Inclusive Technical Reviews

Pro-Active Quantitative Management

Contractually Compliant Software Standards

Robust Software Test Program
Software Acquisition “Best Practice” Contract

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

- Software-inclusive system requirements
- COTS software support requirements

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

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

- Full life cycle software standard
- Other software-related standards

- Software quality
- SW architecture for evolution and legacy transition

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Best Practices that Span the Acquisition Life Cycle

Software Acquisition Risk Management
Software Systems Acquisition

Software Acquisition Risk Management
- **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

Software Systems Acquisition
- **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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# Acronyms and Abbreviations

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<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>Acq</td>
<td>Acquisition</td>
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<tr>
<td>CDR</td>
<td>Critical Design Review</td>
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<td>COTS</td>
<td>Commercial Off-the-Shelf</td>
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<td>Docs</td>
<td>Documents</td>
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<td>DoD</td>
<td>Department of Defense</td>
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<td>DoDI</td>
<td>DoD Instruction</td>
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<tr>
<td>FOC</td>
<td>Full Operational Capability</td>
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<td>GSAW</td>
<td>Ground Systems Architecture Workshop</td>
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<td>IOC</td>
<td>Interim Operational Capability</td>
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<td>KDP</td>
<td>Key Decision Point</td>
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<td>Mgmt</td>
<td>Management</td>
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<td>NSS</td>
<td>National Security Space</td>
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<td>O&amp;M</td>
<td>Operations and Maintenance</td>
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<td>PDR</td>
<td>Preliminary Design Review</td>
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<td>Reqs</td>
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<td>Statement of Work</td>
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