FAA COTS Risk Mitigation

(Practical Methods for Effective COTS Acquisition and Life Cycle Support)

FAA National Software Conference
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En Route IPT Life Cycle Engineer

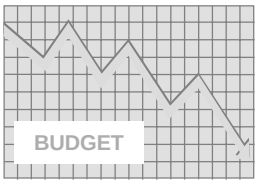
1

A strange thing happened on the way to work one day…

acquisition reform

MORE

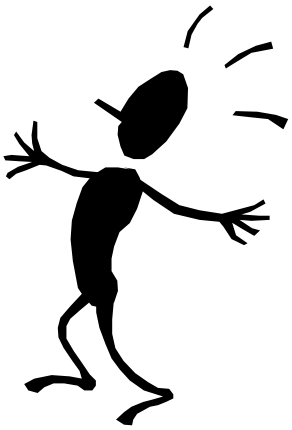
cheaper



better

faster

FAA AMS - 1996



Just go do it!

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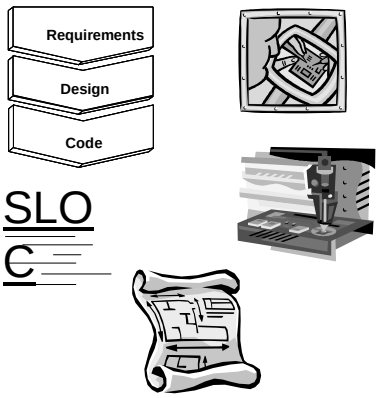
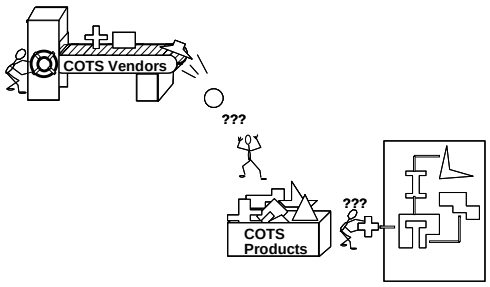
Things became different!





Before
- emphasized development
- specified "how" and "what"

After
- emphasize interface integration
- specify "what," not "how"

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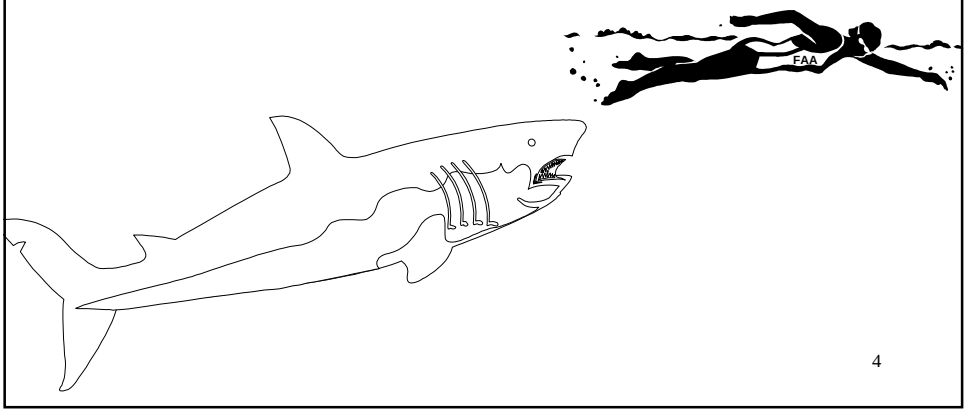
How To Float With The Commercial Market Without Getting Pulled Under



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COTS Risk Mitigation Guide

- 1.1 - Introduction
- 1.2 - COTS Risk Factors
- 1.3 - COTS Risk Mitigation Strategies
- 1.4 - Applying COTS Risk Mitigation Strategies
- 1.5 - Summary
- Appendix A - References
- Appendix B - Understanding COTS Obsolescence and Technology Evolution Planning
- Appendix C - COTS Risk Mitigation Strategies and the Work Breakdown Structure
- Appendix D - COTS Obsolescence Data Analysis
- Appendix E - COTS Technical Performance Factors
- Appendix F - COTS Non-Technical Selection Factors

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Accessible at http://www.faa.gov/aua/resources/cots

COTS Risk Mitigation Workshop

Training Objectives

- Train "practitioners"
  - how and when to apply COTS risk mitigation strategies
  - how to project COTS product obsolescence
  - how to minimize COTS product obsolescence impacts
- Train project leads/managers
  - how COTS risk mitigation strategies contribute to more informed decision-making
  - implement effective COTS planning, budgeting and life cycle support

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Related Workshop Objectives

- Smart consumer - trust but verify
- Repeatable methodology
- Common language
- Market-oriented business practices

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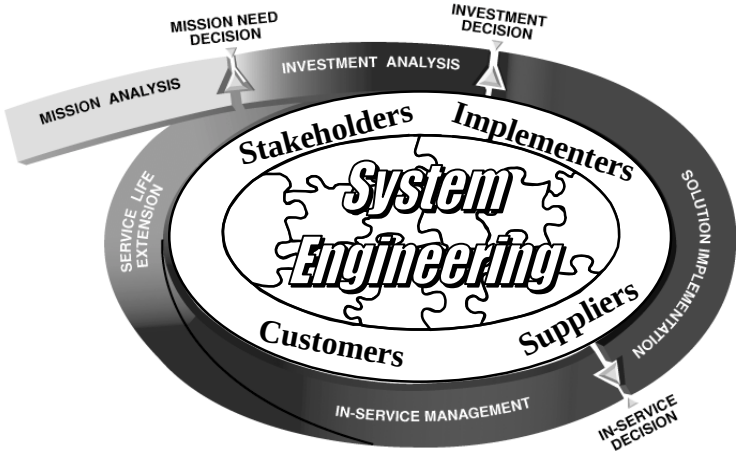
FAA System Engineering



The objective is to provide balanced solutions to complex FAA system needs throughout all life cycle phases

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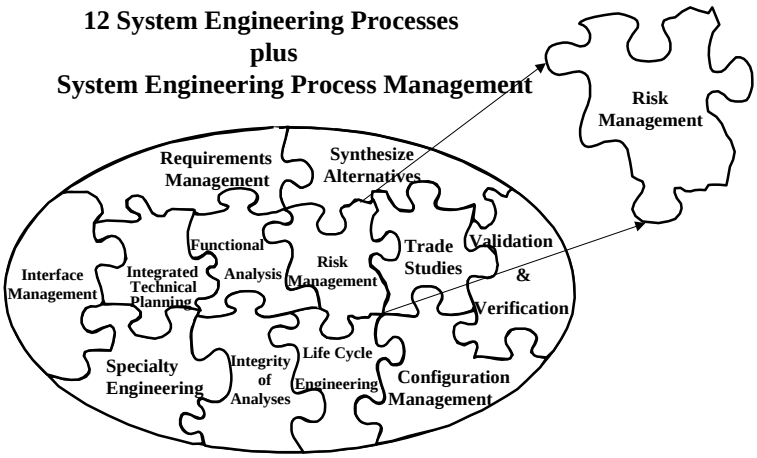
FAA System Engineering Processes

12 System Engineering Processes
plus
System Engineering Process Management



"A discipline that concentrates on the design and application of the whole (system) as distinct from the parts." - Simon Ramo

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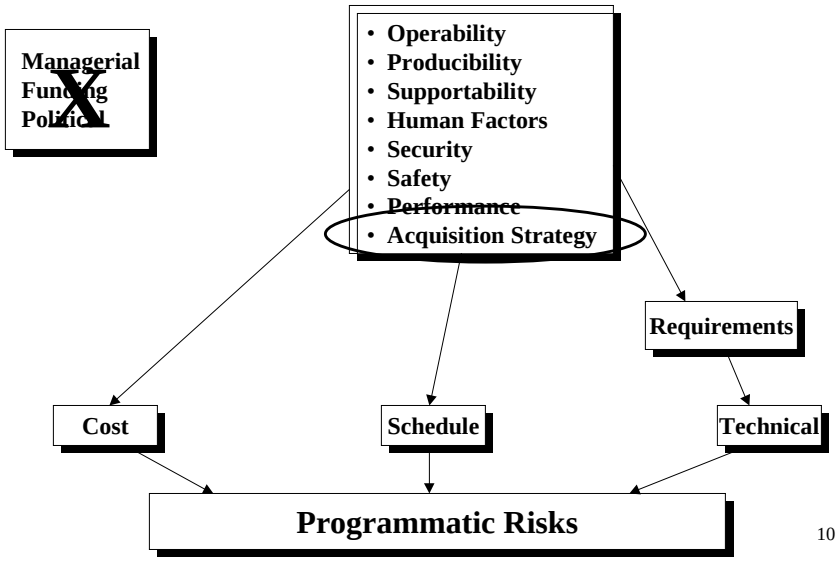
FAA Programmatic Risk Management Risk Identification Flow



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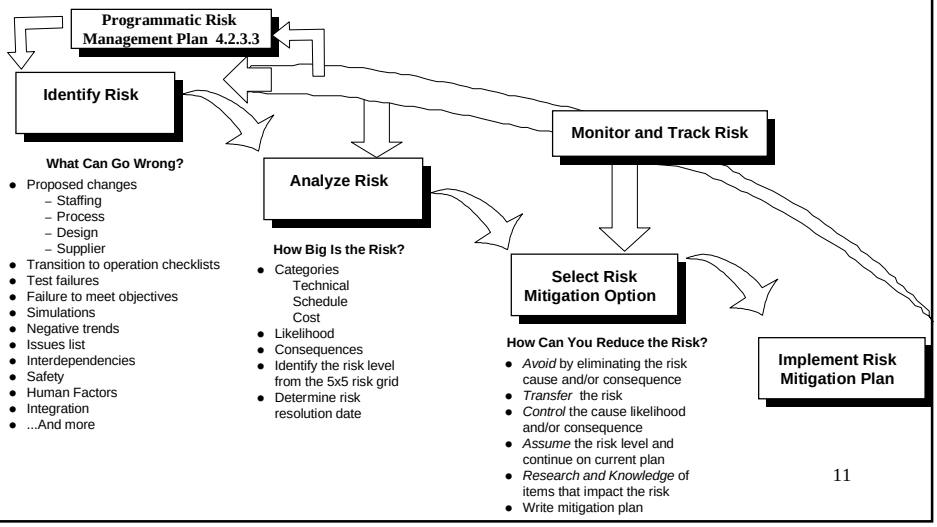
FAA Programmatic Risk Management

Risk: A situation or circumstance which creates uncertainties about achieving program objectives.

Risk Management: An organized, systematic decision-support process that identifies risks, assesses or analyzes risks, and effectively mitigates or eliminates risks to achieving program objectives.



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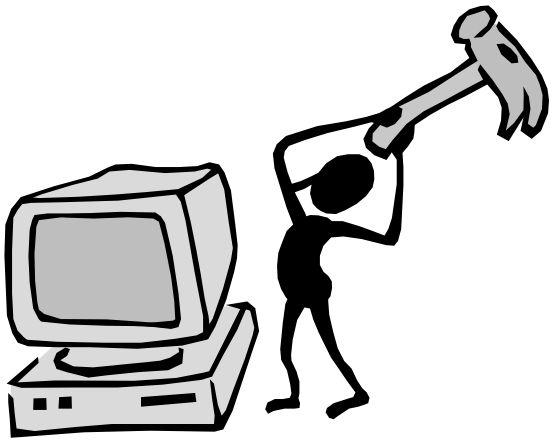

Understanding COTS and COTS Risks

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Why can't we go back to custom-designed systems?

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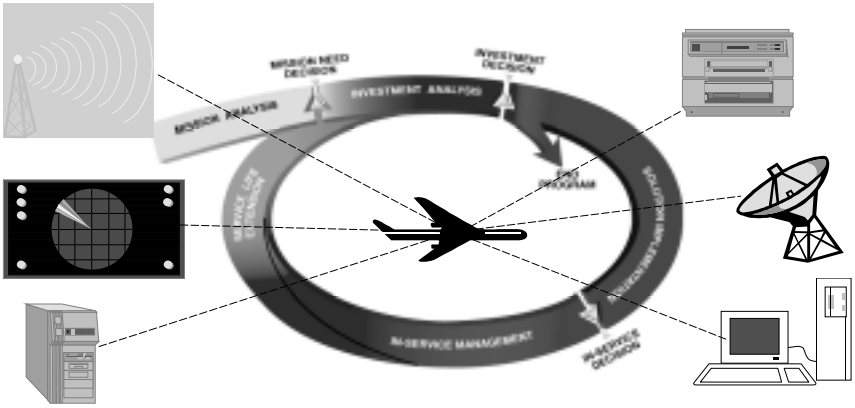
COTS is the Preferred AMS Solution



COTS solutions have already changed the composition of the NAS architecture. COTS product use is a reality we need to recognize and accommodate.

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COTS Product Use Can No Longer Be Avoided

Acquisition Strategy Continuum

"Pure" Custom Development Systems

Hybrid Systems
(COTS, modified COTS, NDI, glue code middleware, custom interfaces, etc.)

"Pure" COTS-Based Systems

Low % ◁—— **Percentage of COTS Products** ——▷ **High %**

COTS risk mitigation applies to all acquisition strategies to some degree.

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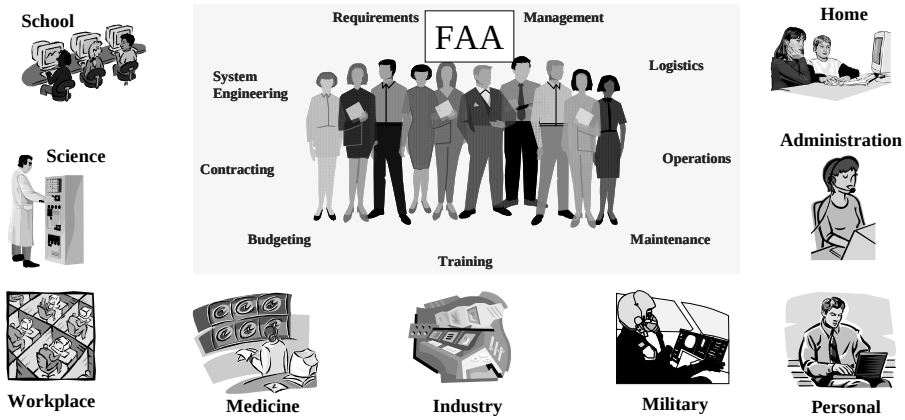
COTS Affects All Information Technology Users



This workshop will focus on how COTS affects FAA automated system life cycle phases and supporting functional areas.

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Identifying COTS Risks

- **Known**
  - loss of design control
  - industry/government "lessons-learned"
  - COTS Risk Mitigation Guide Appendix A – References
- **Unknown**
  - obsolescence
  - rapid technology evolution
  - market behavior

COTS risks are the same for any level of COTS product use

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Understanding Known COTS Risks

1. **Rapid and asynchronous changes**
2. Different obsolescence impacts
3. **Proprietary data**
4. Higher life cycle costs
5. Multiple configurations
6. Different quality practices
7. **"As is" configuration**
8. Commercial standards
9. Time-limited manufacturer support
10. **Information security susceptibility**

When acquiring COTS products, we need to understand, identify and plan for the risks

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COTS Software Risks

- Availability of manufacturer or 3rd party support
- **COTS software compatibility with underlying hardware platform**
- Complexity of COTS software interfaces (e.g. operating system) with other COTS software products/applications, middleware, glue code, custom/legacy interfaces
- Modifying system functionality without unknowingly exceeding a COTS software product tolerance
- **Introducing system "unknown unknowns" (e.g. unused code)**
- Timing differences
- **Licensing options and costs**
- Sole source dependency for critical software components
- **Information security**
- Data rights availability

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COTS Risk Mitigation
(controlling the known risks)

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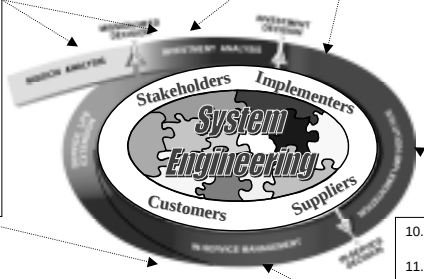
COTS Risk Mitigation Strategies and the AMS

7. Develop and maintain non-technical COTS selection factors
8. Use COTS-sensitive analytical and budget processes
9. Integrate technology evolution planning within the Integrated Program Plan (IPP)

1. Involve COTS-knowledgeable individuals in all analytical processes
2. Involve users early and throughout the program life cycle to identify and resolve COTS-related constraints
3. Perform continuous COTS product market research
4. Integrate market research results with field data and new requirements
5. Develop and maintain flexible performance requirements suited to the use of COTS products
6. Institute and maintain ongoing COTS product testing capability



10. Emphasize strong and COTS-relevant configuration management practices
11. Establish a COTS-experienced systems integration agent
12. Leverage the commercial infrastructure wherever feasible
13. Avoid modification of COTS when possible

Inter-related COTS risk mitigation strategies are integrated into early program planning and applied throughout a system's life cycle

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COTS Risk Mitigation Strategies & Benefits

Number	COTS Mitigation Strategies	Application Benefits	Risk Factors Addressed
1	Involve COTS-knowledgeable individuals in all analytical processes	Facilitates the application of COTS risk mitigation strategies and informed decision-making	#1-6 and #8-10
2	Involve users early and throughout the program life cycle to identify and resolve COTS-related constraints	Reduces chances of surfacing user acceptance issues late in system development and deployment	#1, #3, #4, #6, #7 and #10
3	Perform continuous COTS product market research	Allows product team to project and plan for changes in technology, product configurations and obsolescence-related issues	#1, #2, #4, #5 and #7-10
4	Integrate market research results with field data and new requirements	Optimizes and prioritizes cost, schedule and performance factors between obsolescence-driven system changes and system upgrades	#3, #4, #9 and #10
5	Develop and maintain flexible performance requirements suited to the use of COTS products	Allows for the appropriate level of specified function description and the inclusion of COTS technical performance factors	#7-8 and #10
6	Institute and maintain ongoing COTS product testing capability	Allows project to assess new COTS products/ technologies for specification compliance, form, fit and function compatibility and standards compliance	#1-5, #7, #8 and #10

COTS Risk Mitigation Strategies & Benefits (cont'd)

Number	COTS Mitigation Strategies	Application Benefits	Risk Factors Addressed
7	Develop and maintain non-technical COTS selection factors	Addresses important manufacturer/product selection factors (e.g. quality) not contained in performance/functional specifications	#1 and #3-10
8	Use COTS-sensitive analytical and budget processes	Allows analyses, trade studies, plans and budgets to reflect unique market-driven COTS characteristics and obsolescence projections	#1-10
9	Integrate COTS-based technology evolution planning information within the Integrated Program Plan (IPP)	Provides centralized planning that captures system evolution strategy, obsolescence projections and risk mitigation decisions	#1-10
10	Emphasize strong and COTS-relevant configuration management practices	Reduces the possibility of untested COTS product changes affecting system performance and supports multiple system configurations	#1, #2, #4, #5
11	Use a COTS-experienced systems integration agent	Facilitates acquisition, development, deployment and support activities with proven COTS-capable personnel and services	#1-10
12	Leverage the commercial infrastructure wherever feasible	Prevents costly duplication of already existing COTS product support infrastructure	#4 and #9
13	Avoid modification of COTS products when possible	Prevents loss of product support by the manufacturer and increased life cycle costs	#3 and #7

Risk Mitigation Strategy Structure

What?
Risk mitigation title describes the activity

Why?
How this benefits the practitioner and management
What COTS risk factors are addressed

When?
Applicable AMS phase(s)

How?
Tools, examples, templates, procedures, etc.

If this strategy is ignored?
Consequences

Primary risk impact if strategy is ignored

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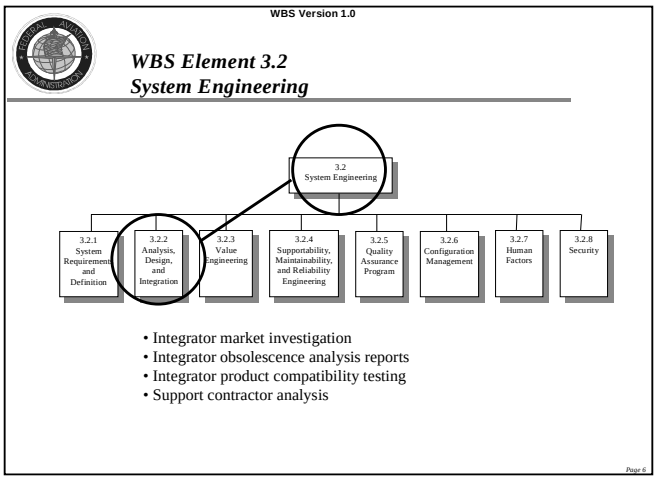
Market Research Activities During Solution Implementation Would Fall Under 3.2.2



WBS templates are available in the AMS FAST toolset, WBS activities mapped out in COTS Guide App. C

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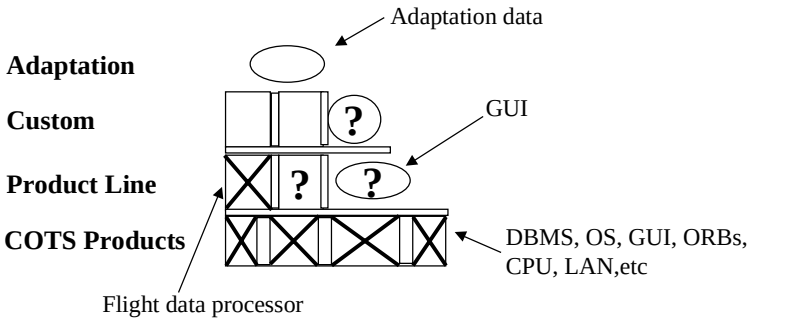
Understanding the System Architecture



Support

X - Not FAA responsibility

? - TBD - FAA or vendor

New application

NDI Component

Contractor product line component

Changed contractor product line component

Glue

Generated code

System support planning becomes easier when the constituent product categories are known

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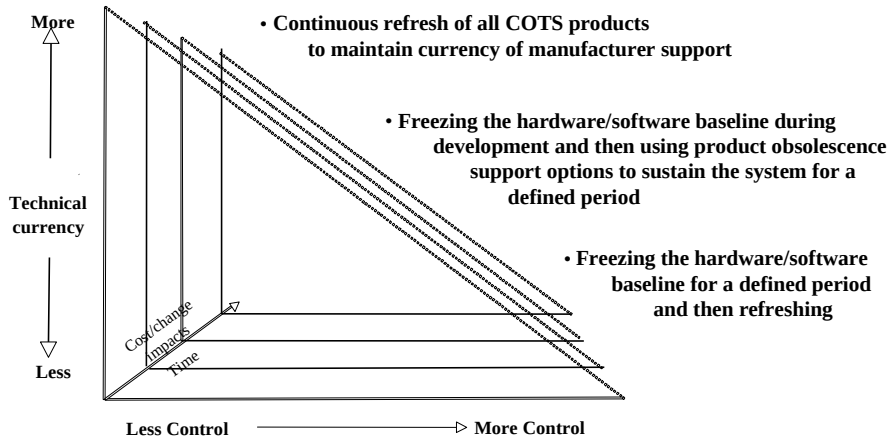
Developing An Effective Strategy



A flexible balance among baseline control, technical currency and change timing factors must be established

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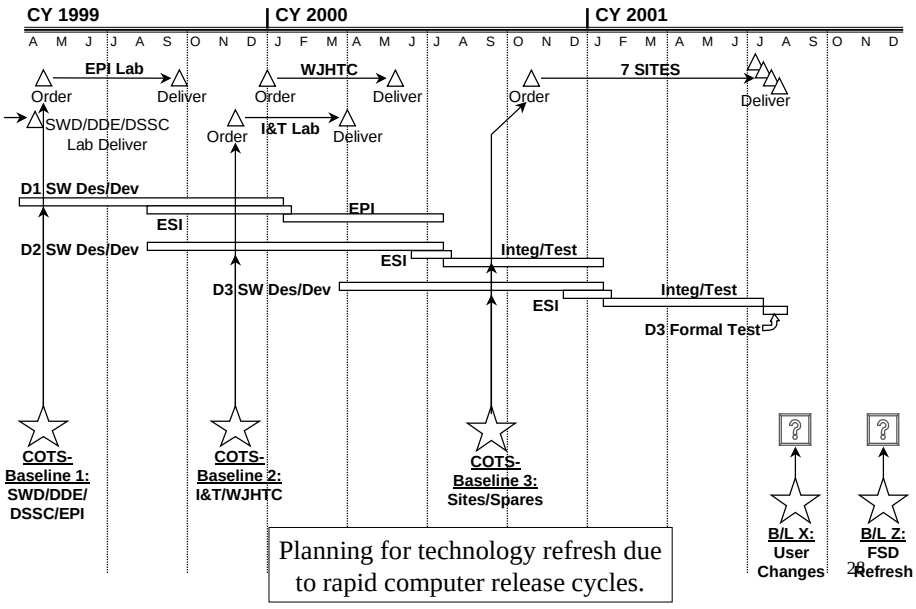
Forecasting System Configuration Changes (URET CCLD)



Planning for technology refresh due to rapid computer release cycles.

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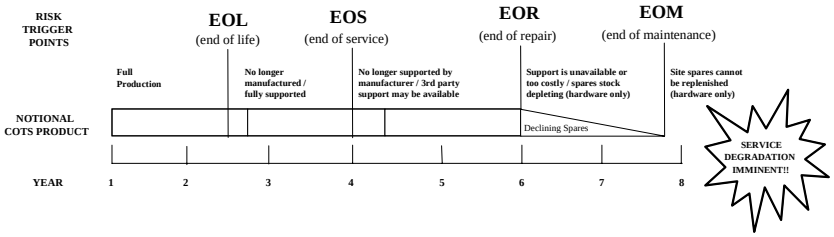
Understanding the Obsolescence Progression

Obsolete - "No longer useful." (Webster)

Obsolescence - "The process of becoming obsolete." (Webster)



Obsolescence is a diminishing level of product support over time.
Each trigger point begs the question "How does this impact my system?".

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System Obsolescence Impacts

NO IMPACT

* sufficient spares versus reliability
* OEM sells rights to third party
* no action required

LOW IMPACT

* F^3 compatible OEM or other vendor sources
* no conjunctive changes to interfacing products
* testing and documentation updates only

MEDIUM IMPACT

* only F^2 compatible products available
* changes to interfacing hw/sw products
* use product obsolescence support options

HIGH IMPACT

* market support almost non-existent
* new technology/products incompatibility
* use product obsolescence support options

It is not a foregone conclusion that all EOL and EOS situations require an immediate response.

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What Market Research Information Information is Needed?

Line Item	System Integrator Part #	Item Description	OEM	Item Type	Qty Per System	End of Life Date	End of Service Date	HW Inter-dependencies	Average Failure Rate (per year)	Failure Rate (last 12 months)	Failure Trend	Total Depot Spares (incl. items in repair)	Ready For Issue Spares	Site Spares

Line Item	OEM's New Product Compatibility	Other F[3] Sources	Other F[2] Sources	Production/ Procurement Lead Time	System Availability Impact	Workaround	Notes/Additional Information

Standardized product obsolescence information needs to be collected periodically to forecast and monitor potential supportability risks

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Market Research Information Element Definitions

Information Block Title	Description
Line Item #	Item identification sequence number assigned by the report originator
Integrator Part #	System integration agent's unique part number assignment
Item Description	Commonly used nomenclature for the item
OEM	Original equipment manufacturer that produced the item
Item Type	Type of product I.e., COTS, modified COTS or custom made
Quantity Per System	Total quantity of items contained in each system
End of Life Date	When the manufacturer no longer produces this item
End of Service Date	When the manufacturer no longer provides repair, replacement or technical support
H/W Interface	Identifies the hardware components that interface with this item
S/W Interface	Identifies the software components that interface with this item
Average Failure Rate (Per Year)	The average number of actual failures per year of this item. If the system is newly fielded, mean time between failure projections may be used until actual failure data is collected
Failure Rate (Last 12 months)	The actual number of failures that have occurred over the past 12 months

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Market Research Information Element Definitions (cont'd)

Failure Trend	Identifies whether or not a failure trend exists (upward, downward or none) by measuring failure data against an agreed upon threshold
Total Depot Spares	The total number of spare assets for this item including those in the repair pipeline but not including site spares
Ready For Issue Spares	The number of immediately usable spares that are available for replenishment
OEM Next Generation Product F^3 Compatibility	Whether or not the next generation product by the OEM is form, fit and function (F^3) compatible with the currently used product
Alternate F^3 Products Available?	Whether or not there are other products on the market from different manufacturers that are form, fit and function (F^3) compatible
Alternate F^2 Products Available?	Whether or not there are other products from the OEM or from other manufacturers that come close to meeting full form, fit and function (F^3) requirements
T&E Time	The amount of time the integrator estimates it will take to acquire the product (or develop a change kit) and the time to test and evaluate the product (or fix) in a system context
Procurement/Production Lead Time	The length of time it will take to acquire and initially deploy production quantities of the change kit
System Availability Impact	Describes the operational consequence(s) of continued failures of this item
Workaround	Identifies temporary methods of addressing continued failures of this item
Notes/Additional Information	Additional related information

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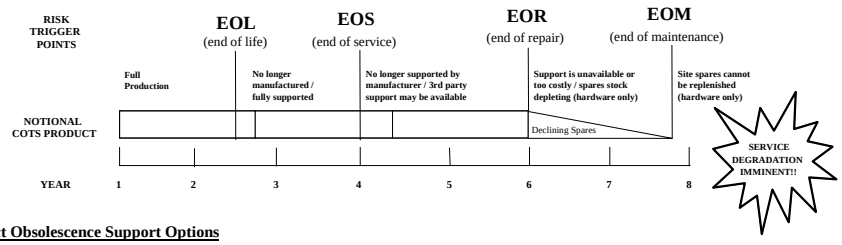
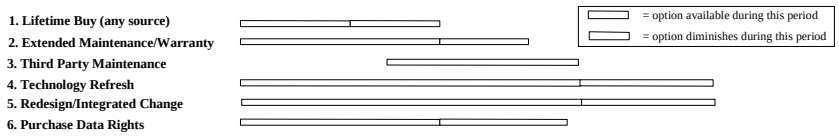
Technology Refresh is Only One of Several Options



Product Obsolescence Support Options



The earlier an obsolescence situation is identified, the greater the number of available support options.

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COTS Product Obsolescence Support Options

Option	Definition
Lifetime Buy (from any source)	The acquisition of (e.g. purchase, cannibalization, trade) sufficient replacement products, components or repair items from any source to meet a projected failure/demand rate or a defined point in time.
Extended Maintenance or Warranty	The purchase of technical and/or repair support from the original equipment manufacturer (OEM) or third party source that extends product support beyond the original timeframe.
Third Party Maintenance	The establishment of a technical and/or repair support capability by a vendor other than the OEM that is qualified to provide that support.
Technology Refreshment (aka Tech Refresh)	"The periodic replacement of COTS products using the same kind of products (e.g., processors, displays, computer O/S, commercially-available software) within the larger system to assure continued supportability of the system through an indefinite service life." (AMS 11/98). Periodicity is based on when the COTS product is no longer supportable. System performance baseline remains unchanged.
Redesign/Integrated Change	When product obsolescence must be addressed by a system design change (e.g. incompatible products, new technology) or when replacement of obsolete products is integrated with a larger system upgrade or pre-planned product improvement (P^3I).
Purchase Data Rights	An arrangement made between a product user and an OEM to secure the proprietary data rights (e.g., drawings, software, documentation) for a product to assume organic (internal) or third party support for that product.

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Assessing a System Integrator's COTS Management Experience

- Overall experience / success for delivering COTS-based systems
- Complexity of the systems delivered
- Market research capability
- Bias towards particular COTS product lines
- Effective manufacturer relationships / vendor network
- Management and staff experience
- Life cycle cost and support orientation
- Preference for modifying COTS
- Process for selecting COTS products
- Obsolescence management / technology refresh processes

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COTS-Specific Contract Requirements and Deliverables

- No COTS modifications without trade off and formal approval
- Incorporation of the COTS non-technical selection factors into the design analysis process
- Incorporation of COTS technical factors into the specification
- Best commercial practices (BCP) deliverables/products
- Continuous market research
- Dedicated COTS product test capability
- Integrate COTS risk mitigation strategies with programmatic risk management
- Periodic COTS product obsolescence projections and working groups
- Technology evolution planning data / supportability analyses
- Use of COTS-adapted life cycle modeling and trade off tools
- Incentives to optimize design decisions based on total ownership costs
- Provisions for contractor provided technical, maintenance and logistics support

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Non-Technical COTS Selection Factors

- Product maturity
- Manufacturer stability
- Manufacturer flexibility
- Upward/downward compatibility
- Market share
- Reputation
- Business projections
- Quality practices
- Sole source
- Total cost of ownership
- Warranty
- Licensing

Functionally equivalent COTS products need to be discriminated using non-technical selection factors

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COTS Systems Evolve Indefinitely!

DEVELOPMENT (F&E) | NAS HANDOFF (OPS) | OPERATIONS (OPS)

Current Budget Model

DEVELOPMENT (F&E) | OPERATIONS (OPS) / SUSTAINMENT (F&E)

COTS-Oriented Sustainment Model

- Alternate Parts Matrix
- Life Cycle Cost Analyses
- Compatibility Testing
- NCP Test, Integration, Validation
- Technical Support
- Training updates/conducts
- Market Research/Tech Forecast
- Product Evaluation/Prototyping
- Test Bed Facilities/Support
- Integrated Change Development
- Configuration Management
- Obsolescence analysis

The *continuous* changes within COTS-based systems demand a corresponding stream of developmental F&E funding coordinated with operations funding

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What is the Proverbial "Bottom Line"?

The acquiring activity must be able to provide accurate and detailed technical information to budget personnel and decision-makers to answer the following question:

"What happens if we don't fund this requirement?"

This question must be answered in clear terms of ***operational*** consequences

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Operational Consequences

- **Loss of ground to air communications**
- **Loss of ground to ground communications**
- **Loss of back-up capability**
- **Operational availability (A_o) degraded**
- **Flight safety**
- **Loss of radar or sector coverage**
- **Security**
- **Passenger/airline impacts (e.g. delays, $$, efficiency)**
- **Lack of certification**

Budget justifications for system sustainment must be supported by the best possible data, good analysis and the consequences/risks of non-funding

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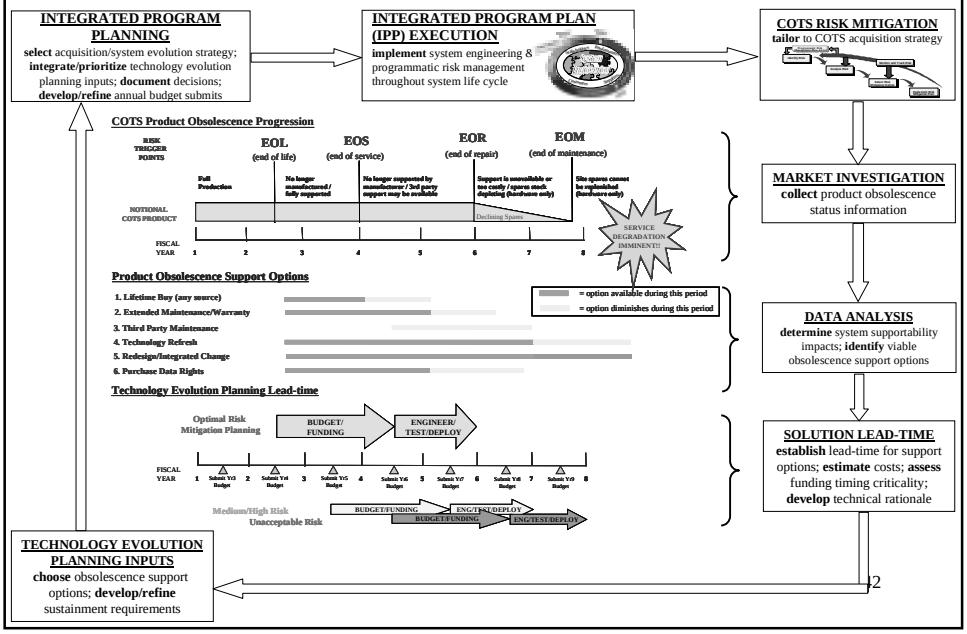
COTS Risk Mitigation/Technology Evolution Planning Flow



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Yes! A Legacy System with COTS Can Still Benefit from COTS Risk Mitigation

	No	Yes	Some
1. Involve COTS-knowledgeable individuals in all analytical processes		✓	
2. Involve users early and throughout the program life cycle to identify and resolve COTS-related constraints			✓
3. Perform continuous COTS product market research (i.e., technology trends, product applicability and obsolescence status		✓	
4. Integrate market research results with field data and new requirements		✓	
5. Develop and maintain flexible performance requirements suited to the use of COTS products			✓
6. Institute and maintain ongoing COTS product testing capability		✓	
7. Develop and maintain non-technical COTS selection factors			✓
8. Use COTS-sensitive analytical and budget processes		✓	
9. Integrate COTS-based technology evolution planning with overall Integrated Program Plan (IPP)		✓	
10. Emphasize strong and COTS-relevant configuration management practices		✓	
11. Use a COTS-experienced systems integration agent			✓
12. Leverage the commercial infrastructure wherever feasible			✓
13. Avoid the modification of COTS products when possible			✓

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COTS Obsolescence Risk Analysis Exercise
(controlling the unknown risks)

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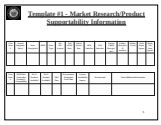
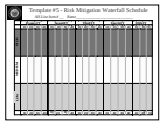
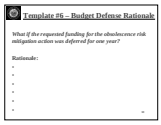
Hardware Supportability Analysis Flow

Market research & supportability information → Determine viable obsolescence support options → Determine risk levels and risk mitigation steps



→ Develop high/med. risk system obsolescence profile → Develop mitigation schedule and funding needs → Provide technical rationale and operational impacts





Use of standard obsolescence analysis templates can help to mitigate COTS obsolescence risks

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Benefits / Summary

- Consistent information presentation format
- Simple step-by-step process
- Data-driven technical rationale
- Risks defined using operational consequences
- Applicable to both legacy and new start programs
- Adaptable to non-COTS products
- Complements logistics support assessments

Allows more informed decision-making for prioritization of system supportability issues

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Obsolescence Risk Analysis Exercise

Objectives

1. **Learn what market research information is needed and the definition of the information elements**
2. **Project end of repair (EOR) and end of maintenance (EOM) dates for COTS products**
3. **Integrate COTS product information into a system obsolescence risk profile**
4. **Analyze and select viable risk mitigation/product obsolescence support options and determine their impact to the system**
5. **Identify and prioritize product obsolescence risk issues and mitigation actions using programmatic risk management templates**
6. **Develop and communicate credible budget defense rationale**
7. **Prioritize program obsolescence issues**

Know what information to ask for, how to understand it, how to mitigate the risks and communicate to management

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Obsolescence Risk Analysis Exercise

AIS Program Situation Summary

Your are supporting the Automated Information System (AIS) project. It is a hybrid system comprised of both custom and COTS products. It has been fielded at 20 sites for about three years and *does not have any COTS risk mitigation* strategies in place.

The contractor has recently indicated that one of its COTS product suppliers just went out of business. Concerned about the other COTS products, your system engineering group has *tasked the contractor* to deliver a *market research report* for all the COTS products in the AIS and you have just received it.

The contractor has summarized the *top 6 COTS product risks* that appear to need attention due to near term end of service dates they have obtained from the product manufacturers and suppliers.

The program's budget does not have any provisions for technology refresh or obsolescence-induced supportability problems. It indicates that an external system interface change requires an *upgrade of the Central Computer Complex* hardware and operating system software. It is scheduled for initial key site deployment *four years from now* with one year planned for development, test and integration.

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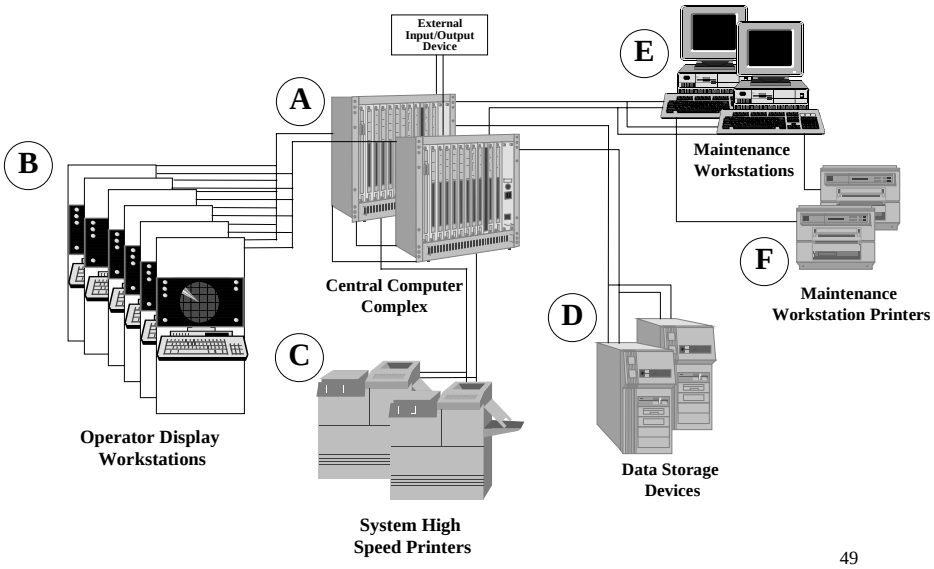
COTS Risk Mitigation

AUTOMATED INFORMATION SYSTEM

Architecture Diagram (notional)



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AIS Operator Display Monitor (ODM) Market Research Information

Line Item #	System Integrator Part #	Item Description	OEM	Item Type	Qty Per System	End of Life Date	End of Service Date	H/W Interface	S/W Interface	Average Failure Rate (per year)	Failure Rate (last 12 months)	Failure Trend	Total Depot Spares	Ready For Issue Spares
6	1000-6	Operator Display Monitor (ODM)	Suny Inc.	COTS	6	24 months ago	6 months from present	A, F	A,F	6	10	Up	20	20

Line Item #	OEM Next Generation Product F^3 Compatibility	Alt. F^3 Products Available?	Alt. F^2 Products Available?	T&E Time	Procurement/ Production Lead Time	System Availability Impact	Workaround	Notes/Additional Information
6	Not F^3 compatible	none	yes	7 months	12 months	loss of workstation	Re-assignment of operator sectors to remaining display workstations (one workstation max.)	current monitor is a sealed unit and not repairable; new OEM monitor is 21" vice current 20"; sole source manufacturer

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Sample Obsolescence Analysis Answers

AIS Line Item 6 - Operator Display Monitor (ODM)

End of Repair Date

- 6 months from present (same as EOS due to OEM being only known support at present)

End of Maintenance Date

- 30 months from present (20 depot spares divided by usage of 10 per year = 24 months + 6 months to EOS)

Product Obsolescence Support Options Analysis

(1) No action required----------not an option due to imminent EOR and EOM
(2) Lifetime buy (any source)----------don't know what OEM or other sources have in stock
(3) Extended maintenance/warranty----------not a repairable unit
(4) Third party maintenance----------not a repairable unit; no F^3 alternate products available
(5) Technology refresh----------don't know the extent of F^2 product differences
(6) Redesign/integrated change----------don't know the extent of F^2 product differences for redesign/no planned workstation changes
(7) Purchase data rights----------not an option due to cost versus benefit

Integrator Tasking/Results

- Task 1: Does the OEM have extra ODMs in stock and available for purchase? Are there other sources for this product?
- Results: OEM indicates that there will be 5 ODMs available for purchase prior to EOS. ABC Monitors Inc. have a stock of 5 available for sale at 50% higher cost.
- Task 2: What are the F^2 product design differences?
- Results: Other F^2 20" display products are available but all would require a major cabinet and wiring redesign.
  A 20" flat panel prototype recently demonstrated at a trade show. High confidence it will meet all functional requirements within existing cabinet space. This self-contained unit would require minor wiring changes only. OEM plans to begin production in two years with prototypes available for testing in approx. one year.

Complete Risk Worksheet and Waterfall Schedule

Recommended Mitigation (derived from risk worksheet)

- Purchase remaining 10 ODMs from Suny and ABC Monitors Inc. to buy time until 20" flat panel can be bought, tested and waterfalled (PLT = 12 months).

Funding Requirements (derived from waterfall schedule)

- Reprogramming required for immediate purchase of ODMs. Funding required next year for prototype procurement and testing. Funding required in two years for development of site replacement kits to begin a waterfalled deployment beginning in three years.

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FAA Risk Worksheet

Program/Project Title AIS **Seq. #:** _____
Submitted by: _____ **Date:** _____

1 Risk: Operator Display Monitor (ODM) will be non-supportable in 6 months.	**2Point of Contact**
3 Source and Root Cause: ODM manufacturer (Suny Inc.) has declared end of service date of 6 months from present. Their next generation monitor is 21"and does not meet the specified requirements nor will it fit in the cabinet without a major redesign.	

4 Risk Assessment			**Rationale**
○ **Technical**	o **Schedule**	o **Cost**	Lack of product support will eventually affect system performance
Likelihood	A B C (D) E		OEM EOS declaration confirmed. Finite asset supply.
Consequence	1 2 3 (4) 5		Loss of operator workstations. System mission performance at risk.

Likelihood	1	2	3	4	5	
E						☐ High
D				X		
C						☐ Medium
B						
A						☐ Low

Consequence

Consequence Definition:
Significant - Given that the risk is realized, the performance would be unacceptable but workarounds would be available.

Risk Resolution Date: NLT 30 months from present to avoid EOM

5	Mitigation Options	Description	New Risk Level if Implemented
☐	**Avoidance**	1. Procure remaining available spare ODMs to buy time for prototype testing and redesign activities.	H (M) L
☐	**Transfer**	2. Procure 20" flat panel prototype, redesign the cabinet as required and perform system tests to determine suitability.	H (M) L
☐	**Control**	3. Produce ODM replacement kits and replace all ODMs with a waterfalled deployment of flat panel replacements prior to EOM.	H M (L)
☐	**Assumption**		H M L
☐	**Research & Knowledge**		H M L

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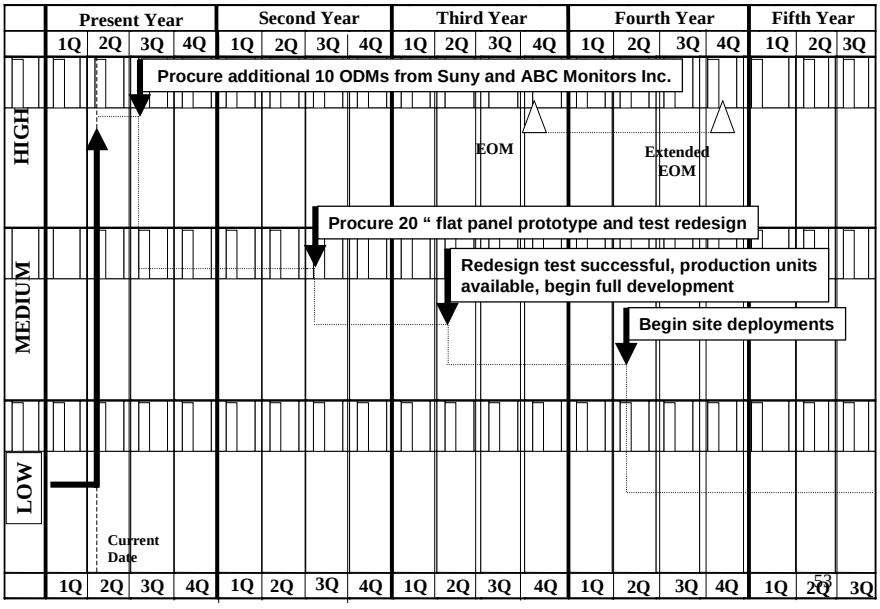
COTS Risk Mitigation

Risk Mitigation Waterfall Schedule

Line Item 6 - Operator Display Monitor (ODM)



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What if...

Funding for flat panel development in third year were deferred for one year?

Budget Defense Rationale

- Failures are accelerating (up 66% from average)
- Extended EOM based on linear failure projection only
- Cannot avoid EOM situation (4th quarter fourth year)
  - Will result in loss of operator workstations
- Mission performance at risk (i.e.; sector loss, flight safety etc.)

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COTS Risk Mitigation

AIS Obsolescence Profile

| LINE ITEM | DESCRIPTION | SYSTEM IMPACT IF RISK REALIZED | SCHEDULE (FY) | | |

COTS Risk Mitigation Summary

• COTS-based systems are real and are here to stay	MUST ACCEPT THIS
• COTS products have unique characteristics (+ and -) & risks	MUST UNDERSTAND THEM
• Rapid obsolescence of COTS products is a primary concern	MUST HAVE A FLEXIBLE STRATEGY
• Mitigation strategies exist to help manage COTS risks	MUST APPLY THEM
• Mitigation strategies are inter-related and generate technology evolution planning information	MUST BE CONTINUOUS AND INTEGRATED

The *strategic* implementation of COTS risk mitigation activities provides the *tactical* information needed for more effective COTS acquisition and life cycle support

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Benefits to the FAA

- Toolkit to standardize repeatable process
  - COTS risk mitigation implementation checklist
  - COTS obsolescence risk analysis procedure and templates
- Nucleus of COTS-oriented FAA personnel
- Business standard for the future

Better knowledge	**Better information**
Better decisions	**Better systems**

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