

**Tool Kit #2 -
Obsolescence Risk
Analysis Templates
(w/samples)**

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COTS-Based System Supportability

Analysis Procedure

Template #1 – Obtain market research and supportability information on system COTS hardware and software products (FAA COTS Risk Guide D.2/D.6.1)

Template #2 – Analyze market research and supportability information to determine viable obsolescence support options (FAA COTS Risk Guide D.3/D.6.2)

Template #3 – Determine risk level(s) and risk mitigation steps for system COTS hardware and software product obsolescence (FAA COTS Risk Guide D.4/D.6.3)

Template #4 – Plot risk mitigation steps on a schedule for each medium or high risk item and identify funding requirements (FAA COTS Risk Guide D.4/D.6.4)

Template #5 – Identify the technical rationale and operational impacts for each item if the required funding is not made available (FAA COTS Risk Guide D.5/D.6.5)

Template #6 – Develop a system hardware and software product obsolescence profile for medium and high risk items (FAA COTS Risk Guide D.5/D.6.5)

COTS Obsolescence Risk Analysis Flow

Market research & supportability information

Template #1 - Market Research & Supportability Information

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
...										
...										
...										

Determine viable obsolescence support options

Template #2 - Obsolescence Analysis Worksheet

Component	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
...										
...										
...										

Determine risk levels and risk mitigation steps

Template #3

Risk Level	Mitigation Step	Priority
High
Medium
Low

Develop mitigation schedule and funding needs

Template #4 - Risk Mitigation Schedule

Activity	Start	End	Priority
...	High
...	Medium
...	Low

Provide technical rationale and operational impacts

Template #5 - Budget Defense Rationale

What if the required funding for the obsolescence risk mitigation activities was delayed for one year?

Risk:

Rationale:

- ...
- ...
- ...

Develop high/med. risk system obsolescence profile

Template #6 - System Obsolescence Profile

System	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
...										
...										

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



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

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

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



Template #2 - Obsolescence Analysis Worksheet

Program _____ Item # _____ Description _____

End of Repair Date:

End of Maintenance Date:

Obsolescence Support Options Viability	Yes	No	Don't Know	Rationale
(1) No action required	_____	_____	_____	_____
(2) Lifetime buy (any source)	_____	_____	_____	_____
(3) Extended maintenance/warranty	_____	_____	_____	_____
(4) Third party maintenance	_____	_____	_____	_____
(5) Technology refresh	_____	_____	_____	_____
(6) Redesign/integrated change	_____	_____	_____	_____
(7) Purchase data rights	_____	_____	_____	_____
(8) Reclamation/salvage	_____	_____	_____	_____

Integrator Tasking/Results (derived from "don't knows" above)

- **Task 1:** _____
- Results: _____
- **Task 2:** _____
- Results: _____
- **Task 3:** _____
- Results: _____
- **Task 4:** _____
- Results: _____

Complete Risk Worksheet and Waterfall Schedule

Recommended Mitigation: (derived from risk worksheet) _____

Funding Requirements: (derived from waterfall schedule) _____



Obsolescence Analysis Worksheet

Program AIS Item # 6 Description Operator Display Monitor

End of Repair Date: 6 months from present (same as EOS due to sole source OEM)

End of Maintenance Date: 30 months from present (20 depot spares divided by usage of 10 = 24 + 6 months to EOR)

Obsolescence Support Options Viability	Yes	No	Don't Know	Rationale
(1) No action required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	imminent EOR and EOM
(2) Lifetime buy (any source)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	don't know if OEM or other sources have this product
(3) Extended maintenance/warranty	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	not a repairable unit
(4) Third party maintenance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	not a repairable unit
(5) Technology refresh	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	no F2 products available; don't know F2 differences
(6) Redesign/integrated change	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	don't know F2 differences; no planned system changes
(7) Purchase data rights	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	don't know F2 differences; no planned system changes
(8) Reclamation/salvage	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	not a repairable unit

Integrator Tasking/Results (derived from "don't knows" above)

- **Task 1:** Determine if OEM has extra ODMs in stock available for purchase. Are there other sources for this product?
- **Results:** OEM indicates 5 ODMs available for purchase prior to EOS. ABC Monitors Inc. has a stock of 5 ODMs available at 75% extra cost.
- **Task 2:** What are the F2 product design differences?
- **Results:** Other F2 20" displays are available. All would require major cabinet and wiring redesign. A 20" flat panel prototype was recently demonstrated at a trade show. Integrator has high confidence it will meet all specified requirements within existing cabinet space. This display would require minor wiring changes only. OEM will have prototypes available for review in one year and begins full production in two years.
- **Task 3:** _____
- **Results:** _____

Complete Risk Worksheet and Waterfall Schedule

Recommended Mitigation: (derived from risk worksheet) Purchase remaining 10 ODMs from Suny and ABC Monitors Inc. to push out EOM date.
Buy the 20" flat panel prototype and test the redesign. Buy production flat panels for waterfalled deployment.

Funding Requirements: (derived from waterfall schedule) Reprogramming required for immediate purchase of ODMs. Funding required next year for prototype purchase and testing. Funding required 2 years from now for production of ODM replacement kits. Funding required 3 years from now to begin waterfalled deployment.



FAA Programmatic Risk Likelihood Definitions

What is the likelihood the risk will happen?

Level		Existing Approach and Processes
E	Near Certainty	...cannot mitigate this type of risk; NO known processes or alternatives are available.
D	Highly Likely	...cannot mitigate this risk, but a different approach might.
C	Likely	...may mitigate this risk, but alternative approaches will be required.
B	Low Likelihood	...have usually mitigated this type of risk with minimal oversight in similar cases.
A	Not Likely	...will effectively avoid or mitigate this risk based on standard practices.



FAA Technical Consequence Definitions

Given the risk is realized, what would be the magnitude of the impact?

Level	Technical	Schedule	Cost
1	Minimal Impact	Minimal Impact	Minimal Impact
2	Minor performance shortfall, same approach retained	Additional tasks required, able to meet key dates	Development or acquisition cost increase $\leq 1\%$
3	Moderate performance shortfall, ...alternatives available	Minor schedule slip, will miss need date without workaround	Development or acquisition Cost increase $> 1\% \& \leq 5\%$
4	Unacceptable performance but alternatives available	Program critical path impact but workaround available	Development or acquisition cost increase $> 5\% \& \leq 10\%$
5	Unacceptable performance and NO alternatives exist	No known way to achieve program milestones	Development or acquisition cost increase $> 10\%$



FAA Risk Worksheet

Program/Project Title AIS Seq. # _____

Submitted by: _____ Date: _____

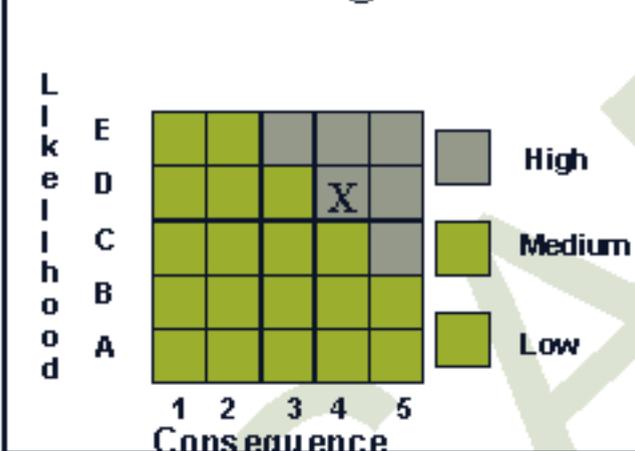
1 Risk: Operator Display Monitor (ODM) will be non-supportable in 6 months. **2 Point of Contact**

3 Source and Root Cause: ODM manufacturer (Sunny 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

<input checked="" type="radio"/> Technical	<input type="radio"/> Schedule	<input type="radio"/> Cost
Likelihood	A B C D E	
Consequence	1 2 3 4 5	

Rationale
 Lack of product support will eventually affect system performance
 OEM EOS declaration confirmed. Finite asset supply.
 Loss of operator workstations. System mission performance at risk.



Consequence Definition:
 Impending end of maintenance situation will initiate system degradation due to loss of workstations, lower system availability and eventually affect system performance and flight safety due to loss of sector management capability. Unacceptable system performance but with alternatives available makes the consequence a level 4.

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

5 Mitigation Options	Description	New Risk Level if Implemented
<input type="checkbox"/> Avoidance	1. Procure remaining available spare ODMs to buy time for prototype testing and redesign activities.	H (M) L
<input type="checkbox"/> Transfer	2. Procure 20" flat panel prototype, redesign the cabinet as required and perform system tests to determine suitability.	H (M) L
<input type="checkbox"/> Control	3. Procure flat panel production units and develop ODM replacement kits.	H (M) L
<input type="checkbox"/> Assumption	4. Begin waterfall replacement of ODMs at sites.	H M (L)
<input type="checkbox"/> Research & Knowledge		H M L



Template #4 - Risk Mitigation Waterfall Schedule

Program _____ Item Name _____

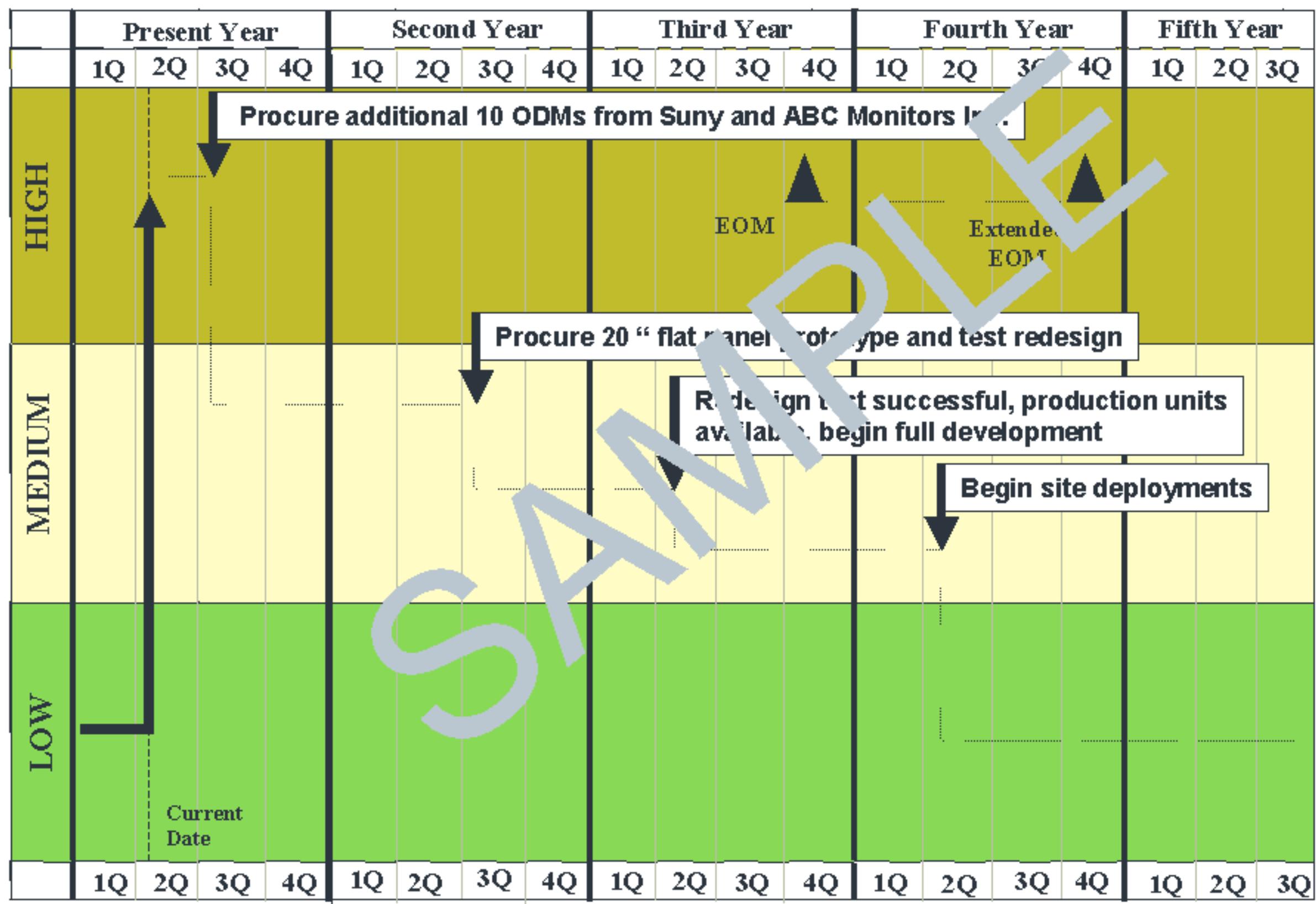
	Present FY				Second FY				Third FY				Fourth FY				Fifth FY		
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q
HIGH																			
MEDIUM																			
LOW																			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q

Current Date



Risk Mitigation Waterfall Schedule

Line Item 6 - Operator Display Monitor (ODM)





Template #5 – Budget Defense Rationale

What if the requested funding for the obsolescence risk mitigation action was deferred for one year?

Risk:

Rationale:

-
-
-
-
-
-



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



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.)

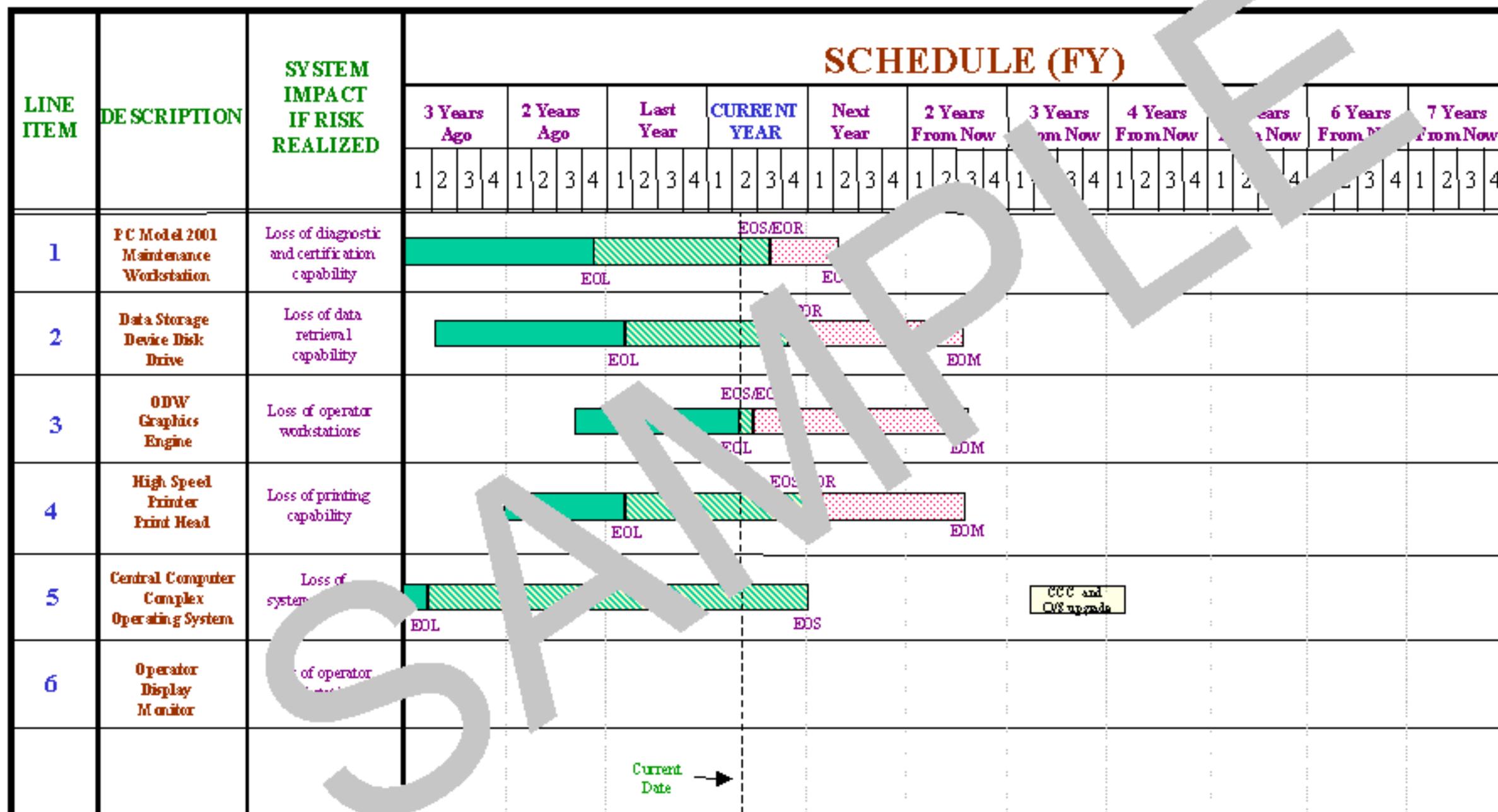


Template #6 - System Obsolescence Profile

ITEM	DESCRIPTION	SYSTEM IMPACT IF RISK REALIZED	SCHEDULE (FY)																															
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1																																		
2																																		
3																																		
4																																		
5																																		
6																																		

EOL (end of life) – no longer manufactured / out of production
EOS (end of service) – no longer supported by manufacturer / 3rd party support may be available
EOR (end of repair) – support is unavailable or too costly / spares stock is depleting (hardware only)
EOM (end of maintenance) – site spares cannot be replenished (hardware only)

AIS Obsolescence Profile



- EOL (end of life)** – no longer manufactured / out of production
- EOS (end of service)** – no longer supported by manufacturer / 3rd party support may be available
- EOR (end of repair)** – support is unavailable or too costly / spares stock is depleting (hardware only)
- EOM (end of maintenance)** – site spares cannot be replenished (hardware only)