

AF Life Cycle Management Center

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Risk and Issue Management in Acquisition Programs

**Marja Weaver
AFLCMC/AZE
DSN 785-5553
Comm 937-255-5553
Marja.Weaver@us.af.mil**



Overview



- **A SecDef Who Understood Risk**
 - Risk statement breakdown
- **The AF Life-Cycle Risk Management (RM) Process**
 - Risk Management in Pre and post Award
- **AF 63-101 Mandatory RM Requirements**
- **AFLCMC Risk & Issue Management in Acquisition Programs Process Standard**
- **Linkages to BBP 3.0 Risk Management Initiatives**
 - AFLCMC Program Sufficiency Reviews Std Process
 - AF Independent Assessment of Tech Review
- **Slaying the 5 Dragons of Risk Management**
- **On the Horizon**
- **Online Bonus Material (Download this brief !)**
 - References and links
 - More training Opportunities on Risk
 - How to Participate in AFIT research on Risk Management



Former SeDef Rumsfeld



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- A man who understood risks - and how to manage the press:

“...there are known knowns; there are things we know that we know. **There are known unknowns; that is to say, there are things that we now know we don't know.** But there are also unknown unknowns – there are things we do not know we don't know”

Acquisition RISK

A **risk** is a **future** event that, if it occurs (**uncertainty**), may cause a **negative** outcome or an execution failure in a program within defined performance, schedule, and cost constraints.



Risk Statement Breakdown



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- **Risk Statement Example:**

IF the rocket plume overloads the weapon bay door hinges during DT&E ,

THEN a hardware redesign is required to achieve full launch envelope

- ***If (Condition)*** A concise description of the potential threat (risk)
- ***When (Trigger Point)*** A date or a major milestone at which a condition will begin to negatively impact the program
- ***Then (Outcome)*** A brief description of the additional activities that would be required if the risk occurs. (Becomes an issue, primary plan not effective, failed, and/or not available)



AF Life Cycle Risk Management



Risk Management: the practice of dealing with future, potential, negative events -- Forward-looking, structured, continuous

■ **Standardized Process Steps (at the Macro Level)**

- 1 - Risk Management Planning
- 2 - Risk Identification
- 3 - Risk Analysis
- 4 - Risk Handling Planning and Implementation
- 5 - Risk Tracking



AFPAM 63-128 revised 10 Jul 14

All steps occur throughout life cycle



Pre-Award Risk Management



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- **Pre-Award risk ID and handling should:**
 - Shape you RFP
 - Influence the contract type
 - Help establish business practices
 - Influence source selection process
 - Lead you to “discriminators”
- **Goal of pre-award risk assessment is NOT:**
 - Creating a risk matrix for the ASP briefing
 - Identifying just risks to getting on contract

**Pre-Award Risk ID and handling are elements of long-range planning
PRE-AWARD refers to timing of assessment, NOT scope of activities assessed!**



Post-Award Risk Management



- **Post-Award assessments ID emerging risks**
 - **Systematically and continuously**
 - **Technical and program reviews**
 - **Relevant to upcoming program phases**
- **Integrated Risk Assessment**
 - **IDs emerging risks and re-assesses current risks**
 - **Collect sufficient data for statistical analyses**
 - **Analyze impacts of risks on Schedule and Costs**
 - **Monte Carlo analysis provides “confidence levels”**
 - **Potentially impacts program cost/schedule allocations**



Probability & Consequence



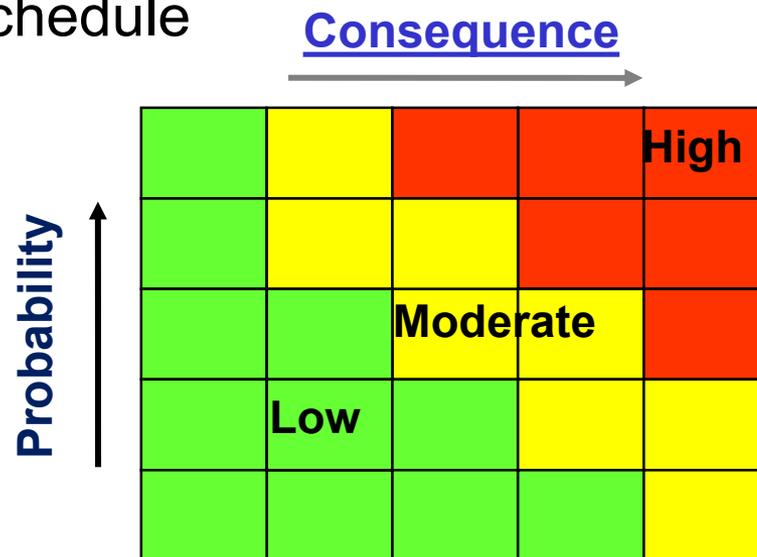
AFI 63-101 Mandatory Rating Std Criteria

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- **Probability** of each risk occurring defined in levels, percentage bands and/or likelihood
 - Assess the “IF” phrase

- **Consequence:** Effect on program if risk becomes a reality
 - Rate Impact of “then” phrase.
- Each risk assessed for impact in performance, cost, and/or schedule

Level	Probability of Occurrence	Likelihood
5	81 – 99 %	Near Certainty
4	61 – 80 %	Highly Likely
3	41 – 60 %	Likely
2	21 – 40 %	Low Likelihood
1	5 – 20 %	Not Likely



If Contractor isn't using AF Std Criteria, then their Risk Matrix must be translated

AF Stds for Probability, Consequence Rating of Performance, Cost, & Schedule*

* See back-up slides or AFPAM 63-128 Chap 12 for AF Std ratings. AFI 63-101 requires AF Std rating criteria documented in AFPAM



MIL-STD-882 Indentified Risks



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- **Must be included in your risk management and reporting**
 - Per AFI 63-101, Risks identified using MIL-STD-882 system safety methodology shall be translated to the AF std 5X5 matrix using this table
 - **Challenge:** Identifying the program risks associated with the MIL-STD-882 ID'd hazard

DoD Acquisition Risk Management Guide

LIKELIHOOD	5		IVA		IIA	IA
	4		IVB	IIIA IIIB IIIC	IIB	IB
	3		IVC	IIID IIIE	IIC	IC
	2		IVD		IID IIE	ID
	1		IVE			IE

MIL-STD-882E

PROBABILITY	A				
	B				
	C				
	D				
	E				
		IV	III	II	I
SEVERITY					



AFLCMC Process Standards and Guides



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- <https://cs4.eis.afmc.af.mil/sites/1534/ProcDir/default.aspx>

Standard processes are approved by the Standards & Process (S&P) Board and their use is mandatory; process guides are approved by process owners (normally functional directors) and, while not mandatory, should be used to ensure greater standardization across the Center.

AFLCMC Process Directory

What is the APD?
 The APD is a collection of standard processes and process guides. Standard processes are approved by the Standards & Process (S&P) Board and their use is mandatory; process guides are approved by process owners (normally functional directors) and, while not mandatory, should be used to ensure greater standardization across the Center. As of 22 Nov 2013, there are 23 approved standard processes; this list will grow to approximately 40 standard processes by Apr 2014. Click on the "Upcoming Standard Processes" link to see the process standardization schedule. There are 78 process guides available today.

How can I request a change to a process? Can I give feedback on a specific process?
 Use this form to contact the APD Maintenance Team to: request a correction to a process; notify us of a policy/process change impacting a process; get help using the site.

How can I find what I need?

Find it by function:
 What function does the work fall under? Click the name of the function in the left column. Then click the process within that function. Now click any listed APD to view.

Check the entire library:
 Click the Process Directory link in the left column to display all available standard processes and process guides. Click any column header to filter the list.

Find it by keyword(s): You can also search by keywords. Type the keywords in the search text box, then click the Go Search button.

This Site: AFLCMC Process Dir

Vision:
 To Forge One Team delivering integrated, innovative, dominant airpower capabilities . . . on time, on cost



Risk and Issue Management is Standard Process reference # A06

Program Sufficiency Assessment is Standard Process reference # A04



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AFLCMC RIM in Acquisition Programs Process Standard



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- **AFLCMC Risk and Issue Management (RIM) in Acquisition Programs**

- Common acquisition process for all PEOs in AFLCMC

- **Beyond AF requirements, AFLCMC RIM Process Std includes:**

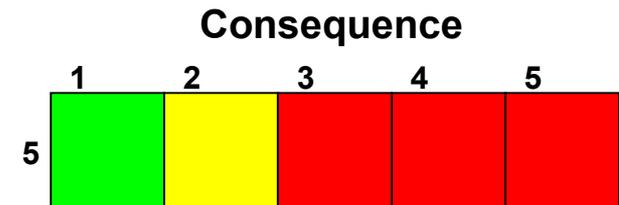
- **Issue Management**

- 100% probability of occurring or realized risk
- Uses “top row” of Risk Matrix to “rate” issues
- Consequence ratings same as Risk

- **Integrated Risk Assessment policy**

- **More descriptive roles and responsibilities**

- **Metric: PM assesses RM Efficiency & Effectiveness**





Ground Rules



- **Does not cover non-Acquisition Risk Management (AFI 90-802) formerly known as Operational Risk Management**
- **Does not cover the identification and analysis of risk performed in Developmental Planning, Capability Determination or Analysis of Alternatives**
- **Honors previous AFLCMC and ASC Leadership decisions unless identified to S&P Board - Changes**
 - **PM review: was monthly now quarterly with bi-annual deep dives**
 - **AF Enterprise Risk Management System (AFERMS) waiver process IAW prior AFLCMC/CV direction to allow “grandfathering”**
 - **SAF/AQ actions may drive revisit in future (AFERMS for upward reports)**
 - **3 letter division appointed AFERMS POC to manage info access**
 - **Placed PM review briefing templates on SharePoint - recommended**
 - **Will update to AFERMS template when chart-worthy templates available**

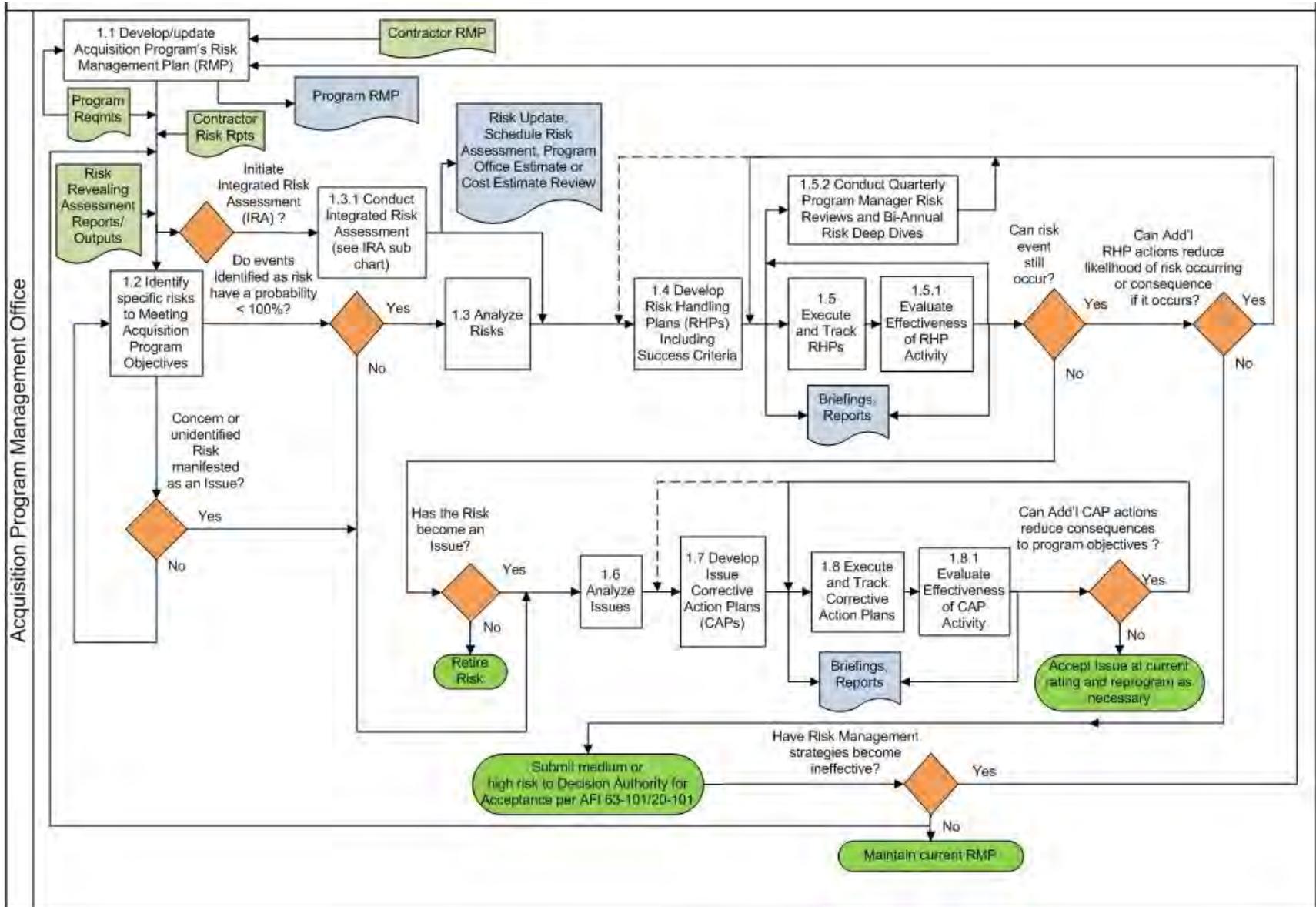


Risk and Issue Management Process Flowchart



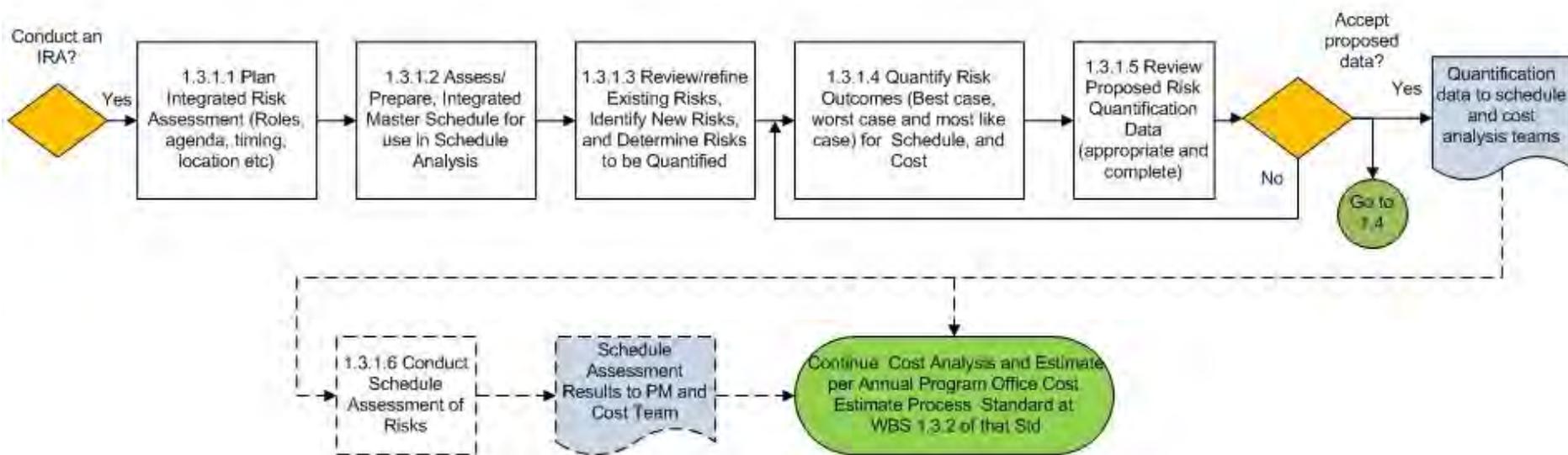
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Integrated Risk Assessment Flowchart



Process for quantifying and analyzing risk impacts on schedule and cost



AFLCMC Risk Metric



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289 programs	RM Process Efficiency	RM Process Effectiveness - Cost	RM Process Effectiveness - Schedule	RM Process Effectiveness -Performance
Question → Response level ↓	To what extent does the program burn-down medium and high risk to acceptable levels compared to initial planned burn-down?	To what extent does program cost stay within the initial or last approved risk adjusted program cost estimate?	To what extent does the program schedule stay within the risk adjustment to the approved initial baseline schedule or last approved rebase-lined schedule?	Has program deferred requirements, capabilities or supportability to a later program increment, or acquisition?
1	Significantly Faster *	Significantly Lower than cost estimate -- >10% less *	Significantly better than risk adjusted schedule -- > 16% reduction *	Some Objective reqm'ts met (where T≠O), no requirements deferred*
2	Faster	Somewhat lower than cost estimate -- >5%, < 10% less	Somewhat better than risk adjusted schedule >8% <16% reduction	No requirements deferred
3	About the same	About the same as risk adjusted cost -- < 5% increase	About the same as the risk adjusted schedule -- + or – 8% change	Only non-KSA/KPP requirements or capabilities deferred
4	Slower	Somewhat higher than risk adjusted cost -- >5% <10% increase *	Somewhat Outside the risk adjusted schedule -- >8% <16% growth *	One or more KSA requirements deferred, no KPPs deferred
5	Significantly Slower	Significantly higher than risk adjusted cost -- > 10% increase *	Significantly Outside the risk adjusted schedule -- >16% *	KPP(s) deferred, or ICS projected as needed after IOC+4yrs*
N/A	N/A *	N/A *	N/A *	N/A *
Can't tell - * - Efficiency only	(ECDs/ACDs of handling activities not tracked)			

For Performance Effectiveness, Deferred means after Initial Milestone Approval. Acronyms: KSA –Key System Attributes; KPP – Key Performance Parameter; ICS – Interim Contract Support; IOC – Initial Operational Capability

For cost effectiveness, these are the percentages previously used in the AF Standard Risk Consequences appropriate for use when looking at the total cost risk associated with the program.

For Schedule effectiveness, 8% = 1 month for every year. Assess against base-lined Required Assets Available (RAA) date

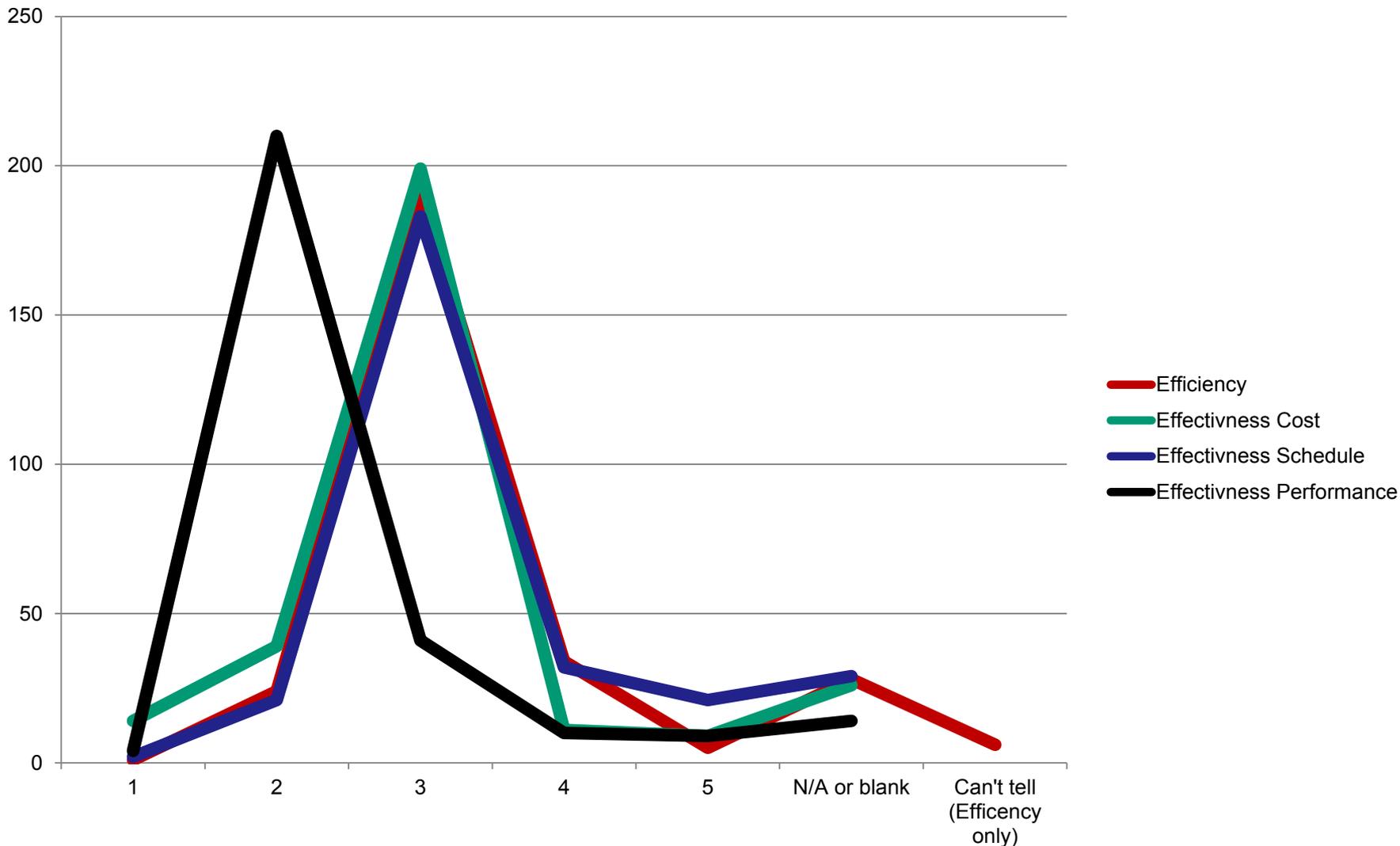


AFLCMC RIM 2014 Metric Results



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Program Sufficiency Reviews (PSR)



AFLCMC Standard Process

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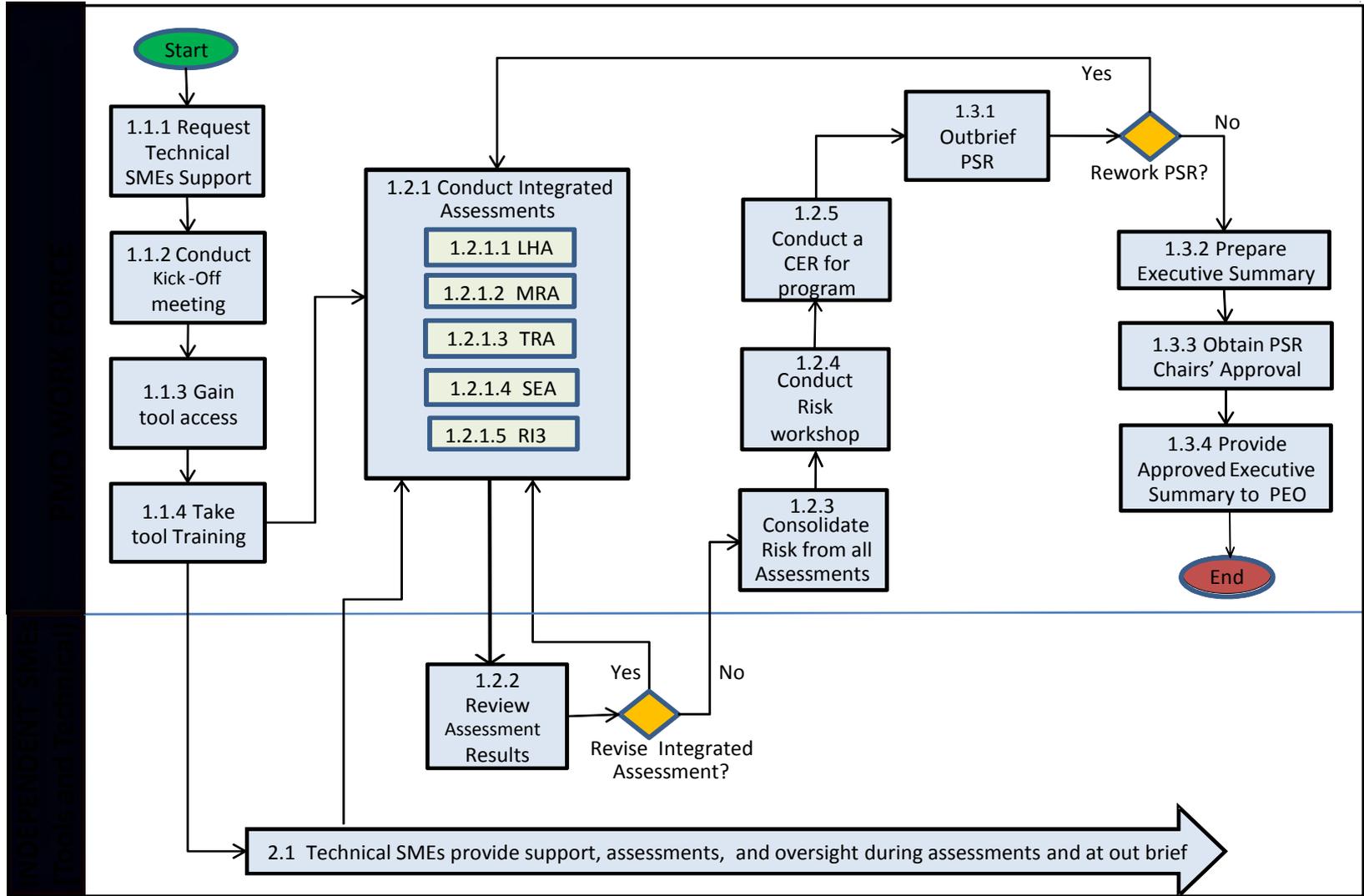
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- **PSR is a process of conducting standardized assessments* culminating in an outbrief to PEO**
 - Emphasis on revealing risks that impact execution
- **Required prior to initial MS for ACAT I's**
 - Other MS and ACAT level PSRs at PEO's direction
 - Uses Center Senior Functional on outbrief panel
- **Center EN Director or designee leads PSR independent technical SME team for ACAT I's**
 - ensures technical integrity and the independency of review of technical assessments
 - ensures submittals of an independent technical risk review to Overarching Integrated Product Team (OIPT)
- **Piloted in 2013 – 2 ACAT I PSRs in progress**

*Technology Readiness Assessment, Manufacturing Readiness Assessment, Logistics Health Assessment, System Engineering Assessment Module, Risk Identification, Integration and -ilities



Program Sufficiency Review Process Flow





Mining for Risks

Methods to Reveal Risks

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- **Results of Program Assessments:**
 - **Technology Readiness Assessment**
 - **Manufacturing Readiness Assessment**
 - **System Safety Hazard Assessment**
 - **Platform Information Technology Architecture Analysis**
 - **Intelligence Supportability Analysis and Intelligence Health Assessment**
 - **Operational Test Readiness Assessment**





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Mining for Risks

Methods to Reveal Risks

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- **Use of standard assessment tools:**
 - **Logistics Health Assessment**
 - **Systems Engineering Assessment Model**
 - **Environment, Safety and Occupational Health (ESOH) Programmatic Risk Toolset**
 - **Risk ID, Integration and –ilities (RI3)***
 - Download from AFLCMC/EN System Engineering toolkit





Independent Technical Review (ITR)

Implementing AF/AQR's Memo*



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- **EN is AQR's independent representative at nine Tech Reviews for MDAPs and MAISs**
 - Codified in AFI 63-101/20-101, Interim Change 2
- **Joint AFLCMC & SMC Process Standard in work**
- **Planned Scope of Independent Review**
 - Risks/Issues
 - SEP/SEMP
 - Technical Management Emphasis Areas
 - Entrance/Exit Criteria
- **Issue report within 30 days**
 - Current and Past Top 3 Technical Risks
 - Current and Past Top 3 Technical Issues
- **At least 12 reviews projected for CY 15**



AF/AQR Memo

* SAF/AQR 13 Nov 14 Memorandum, *Delegation of Authority – Attendance of MDAP and MAIS Principal Formal Technical Reviews* 21

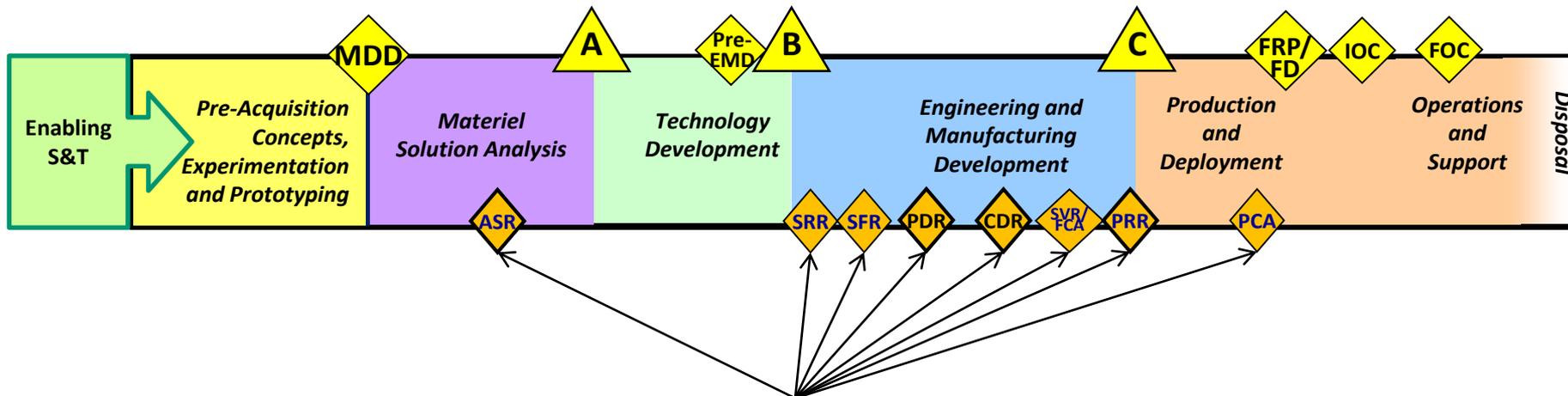


Weapon System Development Life Cycle



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ITRs conducted for SETR Reviews PSRs Prior to MS

Acquisition Terms
 EMD - Engineering and Manufacturing Develop
 FD - Full Deployment
 FOC - Full Operational Capability
 FRP - Full-Rate Production
 IOC - Initial Operational Capability
 MDD - Materiel Development Decision
 S&T - Science and Technology

SETR –System Engineering Technical Reviews
 ASR - Alternative Systems Review
 SRR - System Requirements Review
 SFR - System Functional Review
 PDR - Preliminary Design Review
 CDR - Critical Design Review
 SVR - System Verification Review
 FCA - Functional Configuration Audit
 PRR - Production Readiness Review
 PCA - Physical Configuration Audit

 Formal Principle Technical Reviews
 Formal Report Template Specified



Slaying the 5 Dragons of Risk Management



Systemic Overconfidence

- Recognize bias toward under-estimating risks
- Calibrate the estimators



Illusions of Communication

- Ensure AF Std Criteria used to create Risk Matrices
- Ensure audience knows when Risk Matrix is using AF Stds



Artifacts of Framing

- Framing a risk statement takes practice!
- Beware of crafting risks to fit predetermined solutions



Random Inconsistencies

- Beware of the fatigue factor
- When Rating risk, constantly refer to the criteria



Placebo Effect of Rating

- Quantify Risks - don't just rely on Qualitative ratings (5X5)
- Use Monte Carlo Analysis of Schedule and cost



What's on the Horizon



- **Revised DoD Risk Management Guide for Defense Acquisition Program**
 - **BBP 3.0 alignment**
 - **Emphasis is that this is GUIDANCE**
 - **Services will implement as they determine appropriate**
 - **Service specific Instructions, Policy have precedence**
 - **Final to be posted 30 Jun 15 – Check DAU websites!**



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Questions/Comments?



AFIT Sponsored RM Survey



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- **Goal:** “understand better what the current state of practice in industry and government services is regarding the management of risk in development programs and projects.”

Seeking 500 participants!

- **Review these Briefing Slides**

- **Take Survey at**

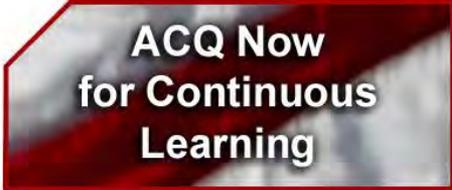
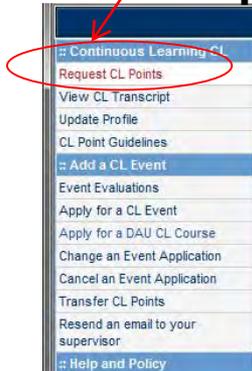
<http://surveys.afit.edu/index.cfm?id=22&stid=2201>



DoD Risk Management Practices

- **Submit request for one CL point to Supervisor via**

<https://www.atrrs.army.mil/channels/acqnowcl/>



Privacy Notice

The following information is provided as required by the Privacy Act of 1974:

Purpose: The goal of the survey is to understand better what the current state of practice in industry and government services is regarding the management of risk in development programs and projects. Results from this survey will be used to identify areas for improvement in the areas of policy and education/training. The survey was developed by MIT's Lean Advancement Initiative (LAI) in collaboration with the Air Force Institute of Technology and Futron.

Participation: ALL ANSWERS ARE ANONYMOUS. No one other than the research team will see your completed questionnaire. Findings will be reported at the group level only.

Confidentiality: We would greatly appreciate your participation. ALL ANSWERS WILL BE KEPT STRICTLY CONFIDENTIAL.



Other RM training Opportunities



- <https://www.atrrs.army.mil/channels/acqnowcl/>
 - *AFIT Life Cycle Risk Management Course, Web-based*
 - *Quarterly Focus Week RIM training WPAFB and DCO*
 - *RIM DCO in conjunction with PM Boot Camp*
- *AFIT Life Cycle Risk Management Course, SYS 208*
 - *3 day in residence class*
- *Program/ directorate tailored training, as available*
- *JIT Risk Workshop Training for Pre-award Teams*
 - *Contact your local ACE*



References



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- ***DODI 5000.02, Operation of the Defense Acquisition System, 25 Nov 13***
- ***AFI 63-101/20-101, Integrated Life Cycle Management, 21 Mar 14***
- ***AFI 63-1201, Life Cycle Systems Engineering, 23 Jul 07***
- ***Risk Management Guide for DOD Acquisition, Aug 06 Update posting 30 Jun 15***
- ***AFPAM 63-128, Integrated Life Cycle Management, 10 Jul 14***
- ***AFLCMC Risk and Issue Management (RIM) Process Std, 22 Nov 13***
- ***AFIT Life Cycle Risk Management Course, SYS 118***
- ***AFMCPAM 63-101, Life Cycle Risk Management, 27 Apr 11***
- ***DI-MGMT-81808, Contractor Risk Management Plans***
- ***DI-MGMT-81809, Contractor Risk Management Status Reports***
- ***MIL-STD 882E , System Safety, 11 May 12***
- **AFLCMC ACE Risk Management SharePoint Site:
<https://cs.eis.afmc.af.mil/sites/ASCACE/pages/Risk%20Management.aspx>**
- **AFLCMC Integrated Risk Assessment SharePoint Site:
<https://cs.eis.afmc.af.mil/sites/ASCACE/pages/Integrated%20Risk%20Assessment.aspx?PageView=Shared>**



Standard AF Consequence

AFPAM 63-128 Chapter 12 as directed for use by AFI 63-101 para 4.13.1

(updated in AFPAM 63-128 10 Jul 14 release)

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Level	Standard AF Consequence - Performance
1 Negligible	Minimal consequence to technical performance or supportability but no overall impact to the program success. A successful outcome is not dependent on this issue; the technical performance goals or technical design margins will still be met.
2 Minor	Minor reduction in technical performance or supportability, can be tolerated with little impact on program success. Technical performance will be below the goal or technical design margins will be reduced, but within acceptable limits.
3 Moderate	Moderate shortfall in technical performance or supportability with limited impact on program success. Technical performance will be below the goal, but approaching unacceptable limits; or, technical design margins are significantly reduced and jeopardize achieving the system performance threshold values.
4 Serious	Significant degradation in technical performance or major shortfall in supportability with a moderate impact on program success. Technical performance is unacceptably below the goal; or, no technical design margins available and system performance will be below threshold values.
5 Critical	Severe degradation in technical performance or supportability; will jeopardize program success; or will cause one of the triggers listed below (Note 1)



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Level	Standard AF Consequence - Performance
5 Critical	Severe degradation in technical/supportability threshold performance; will jeopardize program success; or will cause one of the triggers listed below

Note 1: Any root cause that, when evaluated by the cross-functional team, has a likelihood of generating one of the following consequences is rated at Consequence Level 5 in Performance:

- **Will not meet Key Performance Parameter (KPP) Threshold**
- **Critical Technology Element (CTE) will not be at Technology Readiness Level (TRL) 4 at MS/ A**
- **CTE will not be at TRL 6 at MS/ B**
- **CTE will not be at TRL 7 at MS/ C**
- **CTE will not be at TRL 8 at the Full-rate Production Decision point**
- **Manufacturing Readiness Level (MRL)* will not be at 8 by MS C**
- **MRL* will not be at 9 by Full-rate Production Decision point**
- **System availability threshold will not be met**

* MRLs will be calculated in accordance with the *DoD Manufacturing Readiness Assessment Deskbook*.



Standard AF Consequence

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(updated in AFPAM 63-128 10 Jul 14 release)

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Level

Standard AF Consequence - Schedule

1

Negligible

Negligible program or project schedule slip

2

Minor

Schedule slip, but:

Able to meet milestone dates (e.g. A, B, and C) and other key dates (e.g. CDR, FRP, FOC);

Does not significantly decrease program total float and

Does not impact the critical path to program or project completion date

3

Moderate

Schedule slip that requires closely monitoring the schedule due to the following:

Impacting the ability, but still able to meet milestone dates (e.g. A, B, and C) and/or other key dates (e.g. CDR, FRP, FOC)

Significantly decreasing program total float

Impacting the critical path to program or project completion date

4

Serious

Schedule slip that requires schedule changes due to the following:*

Significantly impacting the ability to meet milestone dates (e.g. A, B, and C) and/or other key dates (e.g. CDR, FRP, FOC)

Significantly impacting the ability to meet the program or project completion date.

5

Critical

Schedule slip that requires a major schedule re-baselining due to the following:*

Failing to meet milestone dates (e.g. A, B, & C) and/or other key dates (e.g. **CDR, FRP, FOC**)

Failing to meet the program or project completion date.

* Exhibit awareness to exceeding Nunn-McCurdy threshold breach for schedule.

Note: Impact varies based on 1) The schedule slip relative to the remaining duration in the program or major milestones; amount of remaining time to work-around the impact; 2) The impact of the slip with respect to key resources.



Standard AF Consequence

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(updated in AFPAM 63-128 10 Jul 14 release)

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Level I	Standard AF Consequence - Cost (A-B refers to MS/KDP)
1 Negligible	<p>For A-B Programs: <1% increase from MS A or last approved Development or Production cost estimate. For Post-B & Other Programs: <1% increase from MS A or last approved Development or Production cost estimate.</p>
2 Minor	<p>For A-B Programs: 1% to <3% increase from MS A or last approved Development or Production cost estimate. For Post-B & Other Programs: 1% to <3% increase from MS A or last approved Development or Production cost estimate.</p>
3 Moderate	<p>For A-B Programs: 3% to <5% increase from MS A or last approved Development or Production cost estimate. For Post-B & Other Programs: 3% to <5% increase in Development or >1.5% increase to Program Acquisition Unit Cost (PAUC) or Average Unit Procurement Cost (APUC) from last approved baseline estimate or >3% increase to PAUC or APUC from original baseline. (1/10 of Nunn-McCurdy 'significant' breach).</p>
4 Serious	<p>For A-B Programs: 5% to <10% increase from MS A or last approved Development or Production cost estimate. For Post-B & Other Programs: 5% to <10% increase in Development or >3% increase to PAUC or APUC from last approved baseline estimate or >6% increase to PAUC or APUC from original baseline. (1/5 of Nunn-McCurdy 'significant' breach).</p>
5 Critical	<p>For A-B Programs: >10% increase from MS A or last approved Development or Production cost estimate. For Post-B & Other Programs: >10% increase in Development or >5% increase to PAUC or APUC from last approved baseline estimate or >10% increase to PAUC or APUC from original baseline. (1/3 of Nunn-McCurdy 'significant' breach).</p>



Deconstructing Rumsfeld



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- “...there are known knowns; there are things we know that we know”

Requirements; Issues

- There are known unknowns; that is to say, there are things that we now know we don't know.

RISKS

negative, future event that although uncertain to occur, would cause an execution failure in the program

- But there are also unknown unknowns – there are things we do not know we don't know”

It's Real- world but not a show-stopper

Perform Quantitative analysis such as Monte Carlo

Add reasonable allowances for unknown unknowns



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Thoughts on “Opportunity Management”



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“Part of the desire to include opportunities and benefits in risk analysis and risk management can be traced to lack of familiarity with the field that already includes those things. Decision (DA) analysis... is a large body of theoretical and applied work that deals with making decisions under a state of uncertainty. It (DA) addresses decisions where tradeoffs have to be made between uncertain costs, uncertain benefits, and other risks.” Douglas W Hubbard, *Failure if Risk Management: Why it's Broken and how to Fix it*

Whenever an investment is made in an opportunity, there has to be a clear understanding that 1- the probability of the opportunity being achieved, is the probability of investment loss.

If there is no chance of loss, it's just a good business practice – not an “opportunity” – Just Do IT!

Assessing Should Cost Initiatives is part of a Decision Analysis process. Risk associated with the SCI must be considered!