



Major Program Support **ODASD(SE)**

NDIA SE Division Meeting

DASD(SE) Risk Management

Mr. James Thompson
June 28, 2017



Making Decisions

Leadership and Culture



**Knowledge/
Information**

Indicators

Risks

**Systems Engineering leadership,
and the expertise of our people make the difference.**



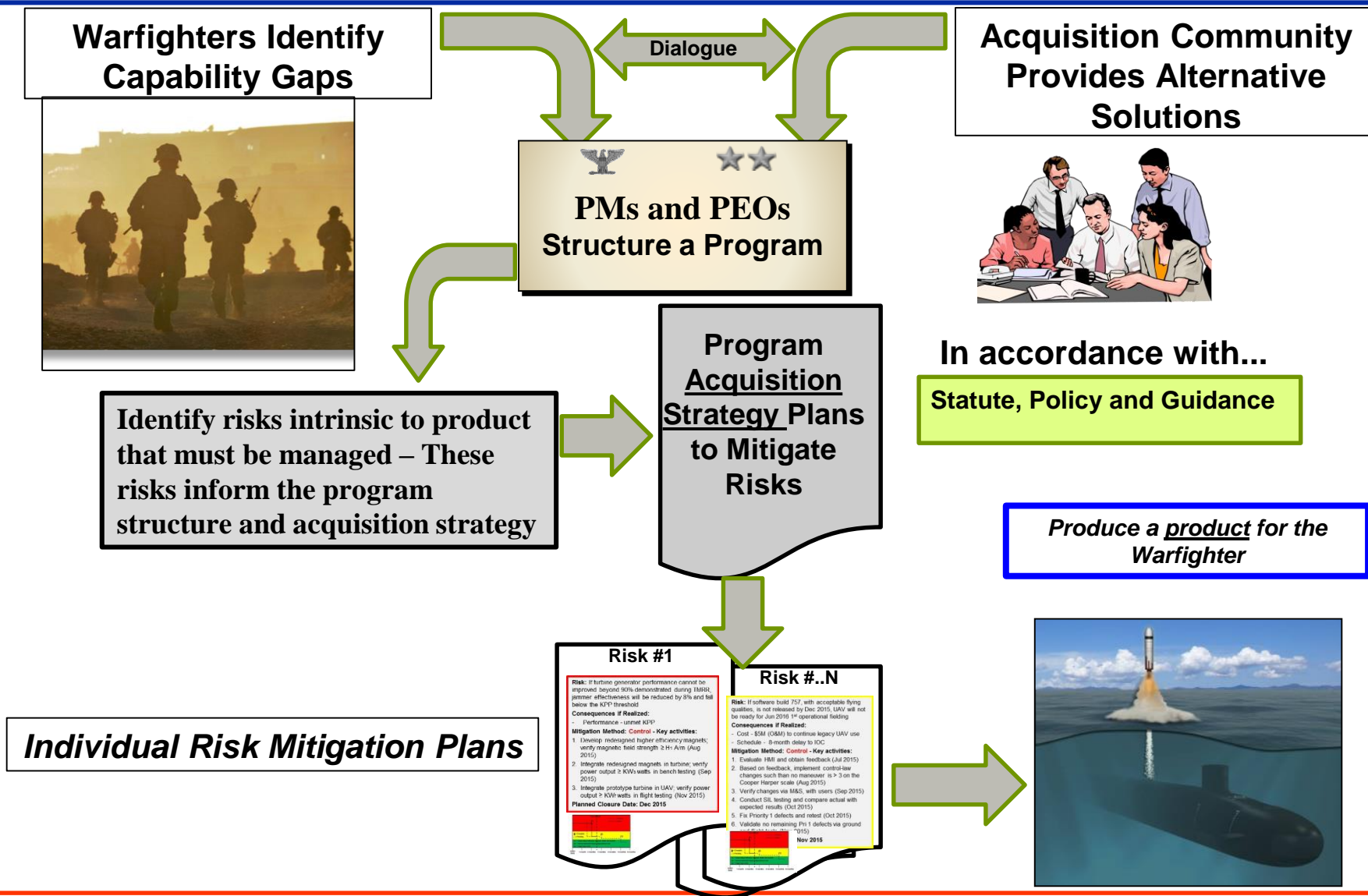
Agenda



- **Introduction**
- **Risk Related Policy and Statute**
 - **Policy and Guidance**
 - **Technical Risk Working Group and 2017 Risk, Issue, and Opportunity Management Guide**
 - **NDAA 2017**
 - **Independent Technical Risk Assessments**
 - **Mission Integration**
 - **Others**
- **How Are We doing?**

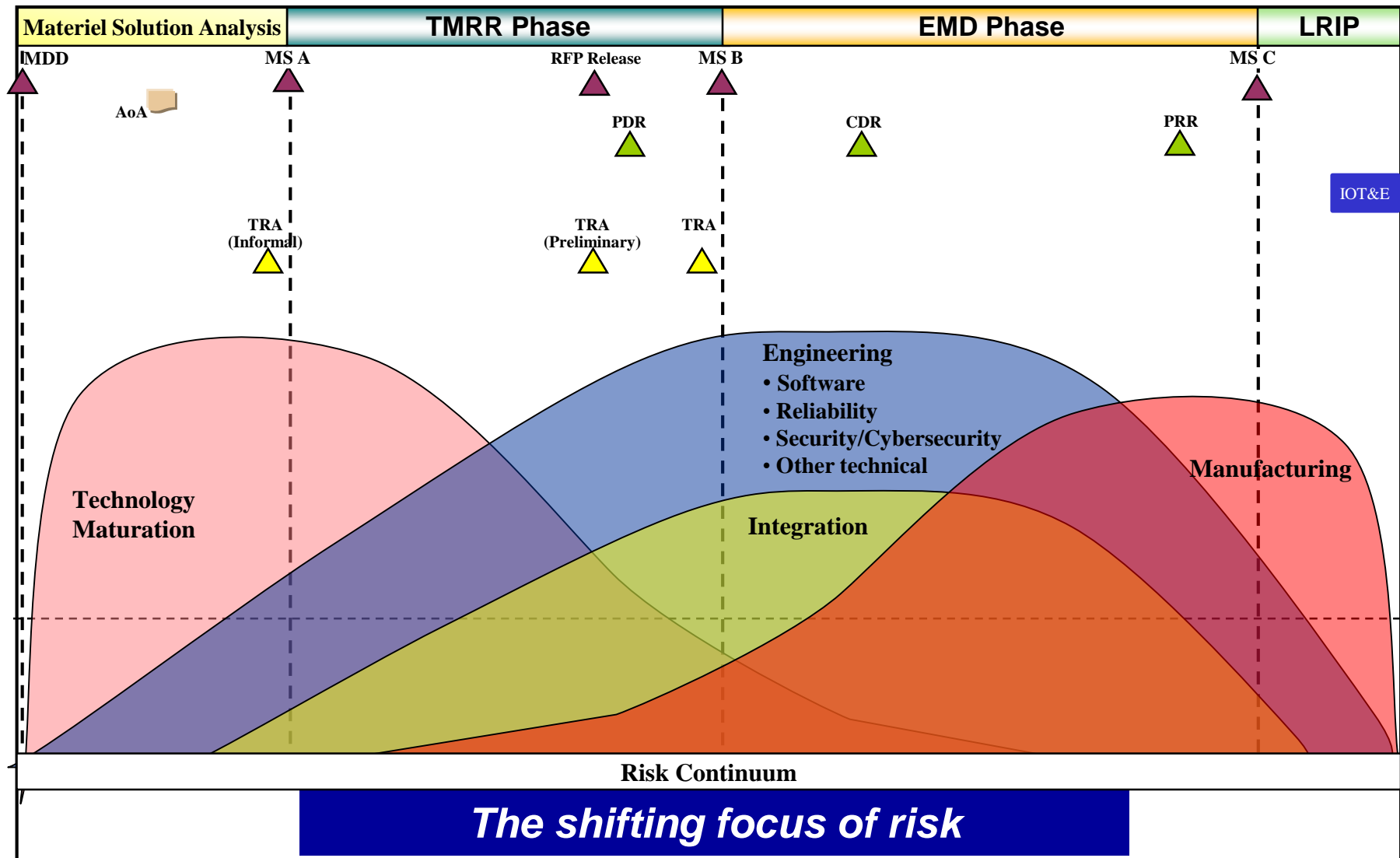


Risks Drive Acquisition Strategy





Risk Focus in Acquisition Life Cycle

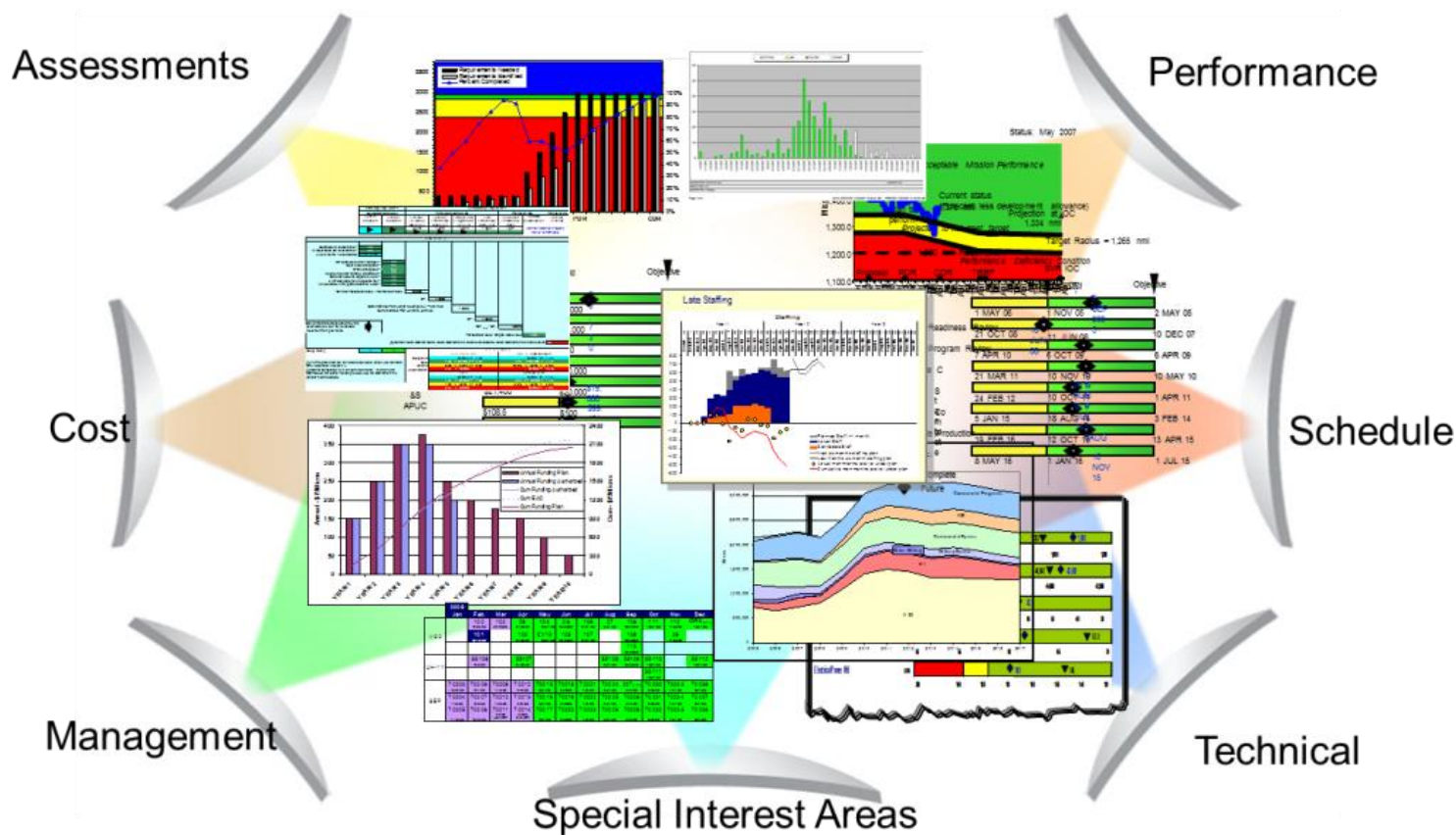




Program Insights and Knowledge & Inflection Points



Program Insight: Metrics, Measures, and Trends



- Tailored by phase -

Knowledge Points, Inflection Points, and Decisions



DASD, Systems Engineering



Acting Deputy Assistant Secretary of Defense
and Principal Deputy, Systems Engineering
Kristen Baldwin

Homeland Defense
Capability
Development
Robin Hicks



Major Program Support
James Thompson

*Supporting USD(AT&L) Decisions with Independent
Engineering Expertise*

- Mentoring of Major Defense Programs
- Independent Technical Risk Assessments
- Overarching Integrated Product Team and Defense Acquisition Board Support
- Systems Engineering Plans
- Systemic Root Cause Analysis
- Development Planning/Early SE
- Program Protection / Cybersecurity
- Software Analysis / Schedule Analysis



Engineering Enterprise
Robert Gold

*Leading Systems Engineering Practice
in DoD and Industry*

- Systems Engineering Policy and Guidance
- Technical Workforce Development
- Specialty Engineering (System Safety, Reliability and Maintainability, Quality, Manufacturing, Producibility, Human Systems Integration)
- Security, Anti-Tamper, Counterfeit Prevention
- Standardization
- Engineering Tools and Environments

**Providing technical support and systems engineering leadership and oversight to
USD(AT&L) in support of planned and ongoing acquisition programs**



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FY 2016 NDAA Acquisition Strategy Risk Management Guidance (Sec 822, § 2431b.)



One Hundred Fourteenth Congress
of the
United States of America
AT THE FIRST SESSION
Begun and held at the City of Washington on Tuesday,
the sixth day of January, one thousand and fifteen

Be It

Enacted, That the Secretary of Defense shall ensure the acquisition strategy ... includes

the following: (1) A comprehensive approach for managing and mitigating risk

(2) An identification of the major sources of risk

(b) APPROACH TO MANAGE AND MITIGATE RISKS...include

consideration of risk mitigation techniques such as the following: (lists

9 items)

1. Prototyping at the system, subsystem, or component level; and competitive

prototyping, where appropriate.

2. Modeling and simulation (detailed in section 9 in Enclosure 3), to include the

need for development of any new modeling and simulation tools to support a comprehensive risk

management and mitigation approach.

3. Technology demonstrations and decision points to discipline the insertion of

planned technologies into programs or the selection of alternative technologies (sections 3

through 8 in Enclosure 3 provide additional discussions of technical management activities).

4. Multiple design approaches.

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Risk Management Governing Policy and Language



**DoDI 5000.02 (Ch 2, 2017)
Enclosure 2 (Program
Management)**

**DoDI 5000.02 (Ch 2, 2017)
Enclosure 3 (Systems
Engineering)**

**DAG Chapter 3, para 3-4.1.5,
Risk Management Process,
Feb 2017 (NEW)**

**Risk, Issue, and Opportunity
Management Guide, Jan 2017
(NEW)**

**USD(AT&L) Memo, “Improving
TRA Effectiveness,” May 11,
2011**

**Implementation Directive for
Better Buying Power 2.0, Apr
24, 2013**

**Implementation Directive for
Better Buying Power 3.0, Apr
09, 2015**

- Technical Risk Peer Reviews
- Updated RIO related curricula
- Risk management repository case studies
- AT&L Magazine Articles



Jan-Feb 2015



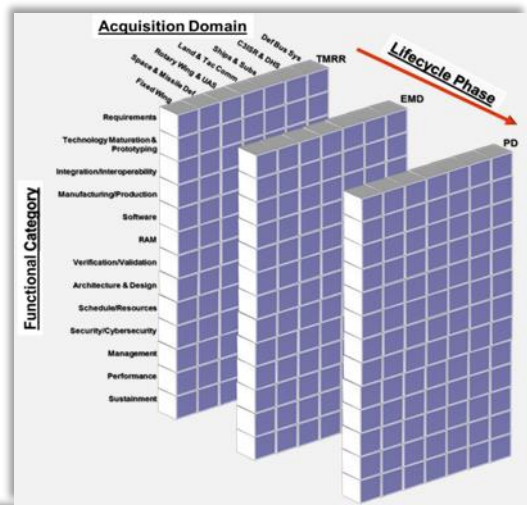
Jul-Aug 2016



Risk Case Studies

The Technical Risk Working Group:

- **Collected over 180 case studies**
 - Categorized in 13 areas of technical risk by domain and lifecycle phases from Services, FFRDCs, Industry, etc.
 - Continuing to review additional case study candidates
 - DAU website contains listing with links to public or CAC-enabled sites where case studies can be found
- **Established mechanisms for generation of new case studies**
 - Services: Implemented various methods to identify and generate new risk related case studies
 - DAU: Senior Service colleges at DAU offer “Technical Risk Case Study” as a research topic
- **How YOU can help!**
 - Let us know if when you see a program successfully mitigate a key program risk
 - Forward us briefings/papers you see on this for us to consider for adding to the case study repository



<https://acc.dau.mil/CommunityBrowser.aspx?id=720387>

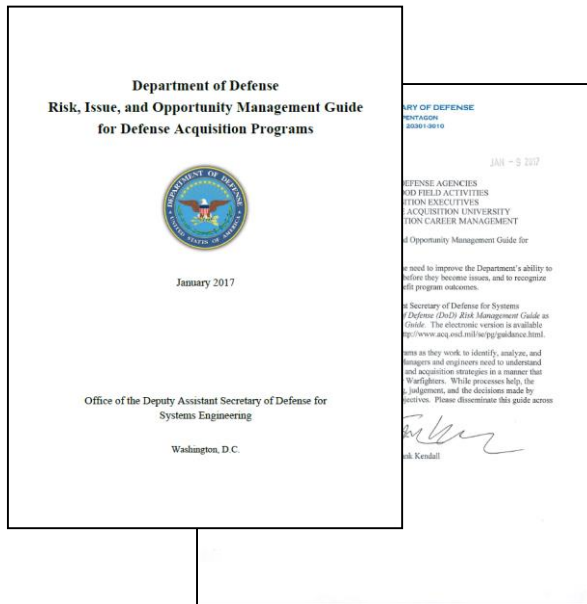


Risk, Issue, and Opportunity (RIO) Management Guide

Managing Technical Risk in DoD Acquisition

• Issued Updated Guide in January 2017

- Product rather than process
- Risks drive Acquisition Strategy
- Expanding risk identification methods
- On ramps and off ramps
- Develop burn-down plans with knowledge points
- Managing opportunities
- Improve Risk statements
- Quantify Risk



2017 DAG
incorporates
this RIO
Guidance

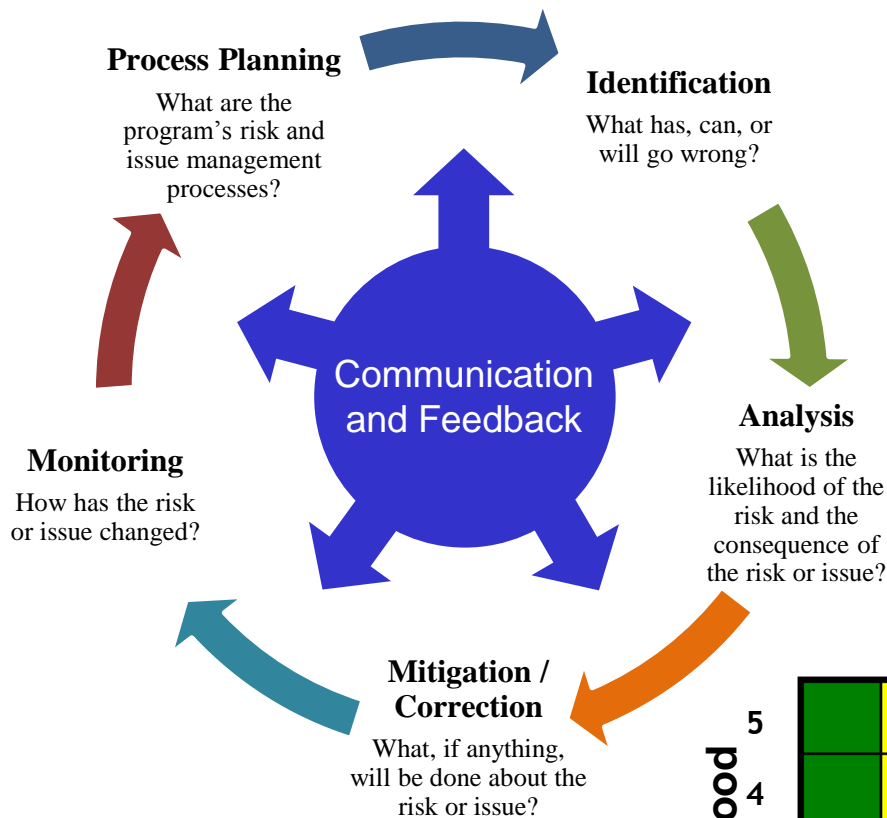


Guide at <https://www.acq.osd.mil/se/pg/guidance.html>



Risk Management

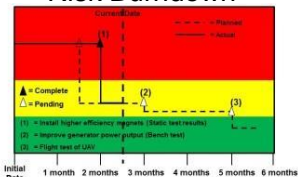
Risks are potential future events or conditions that may have a negative effect on achieving program objectives for cost, schedule, and performance.



Methods:

- Accept
- Avoid
- Transfer
- Control

Risk Burndown



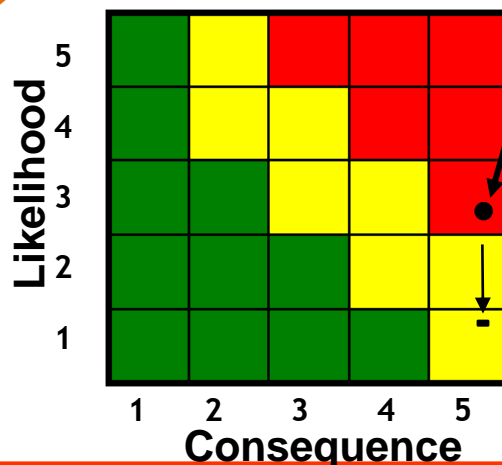
Simplified Consequence Criteria

Level	Cost	Schedule	Performance
5 Critical Impact	10% or greater increase over APB objective values for RDT&E, PAUC, or APUC Cost increase causes program to exceed affordability caps	Schedule slip will require a major schedule rebaselining Precludes program from meeting its APB schedule threshold dates	Degradation precludes system from meeting a KPP or key technical supportability threshold; will jeopardize program success ² Unable to meet mission objectives (defined in mission threads, ConOps, OMS/MP)
4 Significant Impact	5% - <10% increase over APB objective values for RDT&E, PAUC, or APUC Costs exceed life cycle ownership cost KSA	Schedule deviations will slip program to within 2 months of approved APB threshold schedule date Schedule slip puts funding at risk Fielding of capability to operational units delayed by more than 6 months ¹	Degradation impairs ability to meet a KSA. ² Technical design or supportability margin exhausted in key areas Significant performance impact affecting System-of System interdependencies. Work-arounds required to meet mission objectives
3 Moderate Impact	1% - <5% increase over APB objective values for RDT&E, PAUC, or APUC Manageable with PEO or Service assistance	Can meet APB objective schedule dates, but other non-APB key events (e.g., SETRs or other Tier 1 Schedule events) may slip Schedule slip impacts synchronization with interdependent programs by greater than 2 months	Unable to meet lower tier attributes, TPMs, or CTPs Design or supportability margins reduced Minor performance impact affecting System-of System interdependencies. Work-arounds required to achieve mission tasks
2 Minor Impact	Costs that drive unit production cost (e.g., APUC) increase of <1% over budget Cost increase, but can be managed internally	Some schedule slip, but can meet APB objective dates and non-APB key event dates	Reduced technical performance or supportability; can be tolerated with little impact on program objectives Design margins reduced, within trade space ²
1 Minimal Impact	Minimal impact. Costs expected to meet approved funding levels	Minimal schedule impact	Minimal consequences to meeting technical performance or supportability requirements. Design margins will be met, margins to planned margins

Notes:

¹ Consider fielding of capability to interdependent programs as well.

² Failure to meet TPMs or CTPs directly derived from KPPs or KSAs are indicators of potentially not meeting a KPP or KSA



- **Risk ID #85: Risk Statement...**
- **Consequences if Realized:**
 - Cost -
 - Performance -
 - Schedule -
- **Mitigation Method: (Accept, Avoid, Transfer or Control) Summarize activities:**
 1. Summarize Key Activity 1
 2. Summarize Key Activity 2
 3. Etc.
- **Planned Closure Date:**



Using Expected Value to Prioritize Mitigation Efforts



Risk / Opportunity	Likelihood	Consequence Cost / Opportunity Benefit	Risk / Opportunity Weighted Impact	Cost to Mitigate or Pursue	Expected Value/ Return on Investment
Risk 1:	20%	-\$10M	\$2M	\$1M	\$1M (1:1)
Risk 2:	70%	-\$10M	\$7M	\$1M	\$6M (6:1)
Risk 3:	40%	-\$36M	\$14.4M	\$2M	\$12.4M (6:1)
Risk 4:	60%	-\$5M	\$3M	\$.5M	\$2.5M (5:1)
Risk Total		-\$61M	-\$21M	\$4.5M	
Opportunity 1:	70%	+\$3.2M	+\$2.24M	\$260K	\$2.0M (8:1)



Opportunity Management

Opportunities have potential future benefits to the program's cost, schedule, and/or performance baseline.



Opportunity Management Options:

- **Pursue now** – Fund and implement a plan to realize the opportunity
- **Defer** – Pursue/cut-in later; (e.g., request funds for the next budget and request the S&T community mature the concept)
- **Reevaluate** – Continuously evaluate the opportunity for changes in circumstances
- **Reject** – Intentionally ignore an opportunity because of cost, technical readiness, resources, schedule burden, and/or low probability of successful capture



Performance Measures & Metrics

TPM Best Practices

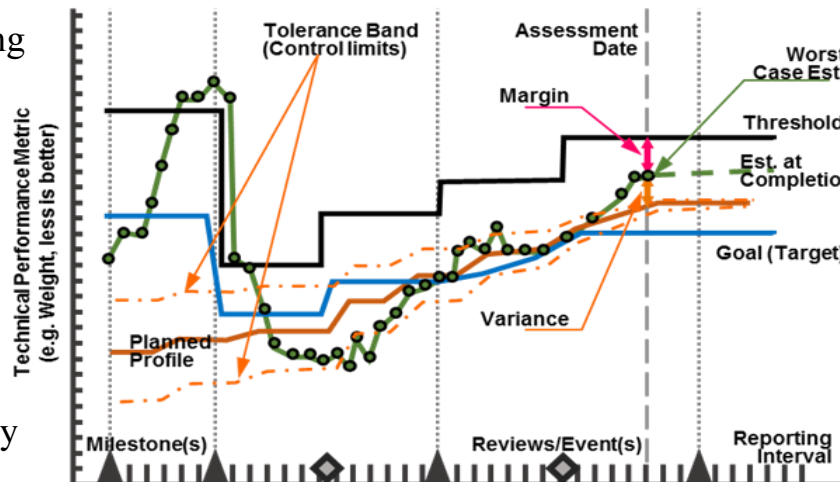
Mentoring Programs

- “Gold Standard” for TPM planning

TPM Planning

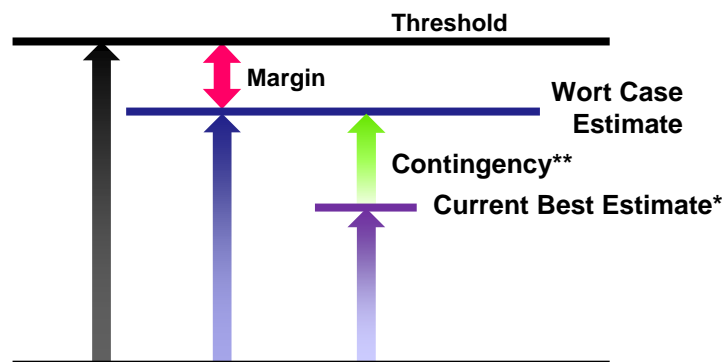
- Threshold & Goal (Target)
- Planned Profile & Tolerance
- Worst Case Estimate (WCE)
 - Each green dot....
- Current Best Estimate (CBE)
 - $WCE = CBE + Contingency$
- Margin

Example of a well thought out TPM



Worst Case Estimate	(WCE) Measured or estimated progress to be compared with planned progress. WCE accounts for contingency (see below)
Estimate at Completion	Forecasted WCE value of a TPM at designated completion
Planned profile	Time phased expected values (based on prior experience)
Tolerance Band	Management control limits representing projected level of error or control within the process
Goal (Target)	Desired objective profile values; Usually set to allow design trade space between Goal and Threshold
Threshold	Limiting acceptable profile values, usually the required or specified values
Variance	Difference between the Planned Profile and WCE
Margin	Difference between the WCE and Threshold value

TPM Margin and Contingency Definitions



***Current Best Estimate** value is the raw estimate of the metric determined either by prediction, analysis, direct measurement, and/or bottoms-up estimation without consideration for error

****Contingency** accounts for the uncertainty in estimation and immaturity of the item being measured.

Assist Program Managers and Lead Systems Engineers with TPM Planning



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FY 2017 NDAA Sec 807 §2448b Independent Technical Risk Assessments



SecDef shall:

- ✦ ensure ITRAs are conducted on MDAPs
- ✦ issue guidance and a framework for categorizing the degree of technical and manufacturing risk

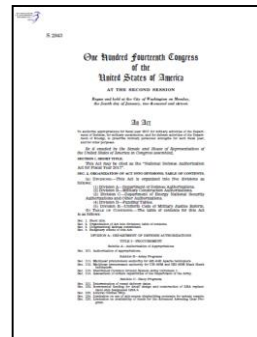
Details

...prior to any decision to enter MS A...MS B...or any decision to enter LRIP or Full Rate Production, or as SecDef deems appropriate

Prior to MS A the ITRA must include the identification of any critical technologies and manufacturing processes that need to be matured

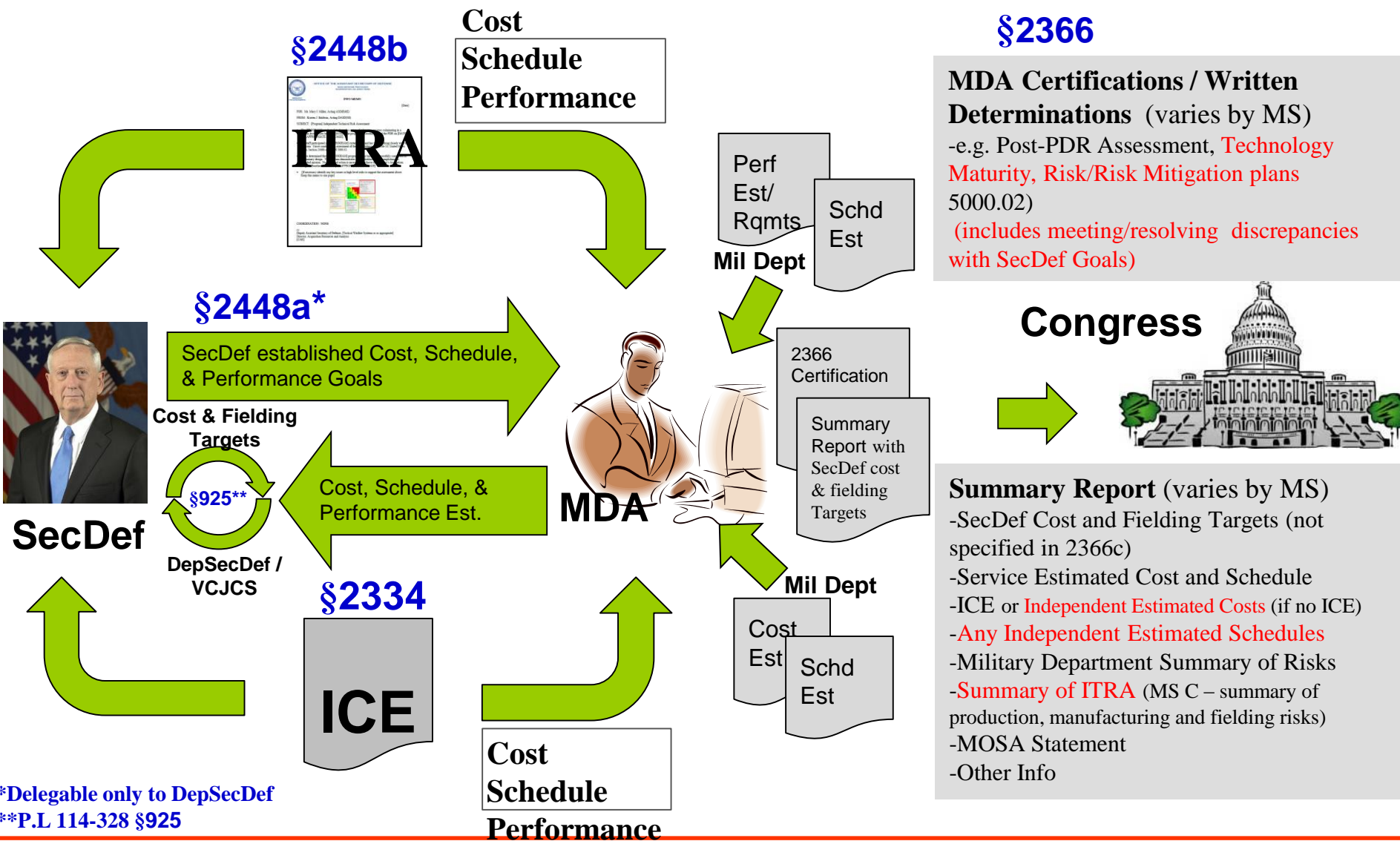
Subsequent assessments must include identification of any critical technologies or manufacturing processes that have not been successfully demonstrated in a relevant environment

Effectivity—MDAPs reaching MS A after October 1, 2017





Cost, Schedule and Performance Transparency





FY 2017 NDAA Sec 855

Mission Integration Management



SecDef shall:

- ✦ establish mission integration management activities for each mission area
- ✦ submit to congressional committees, at the same time as the DoD FY18 budget, a strategy for mission integration management

Details

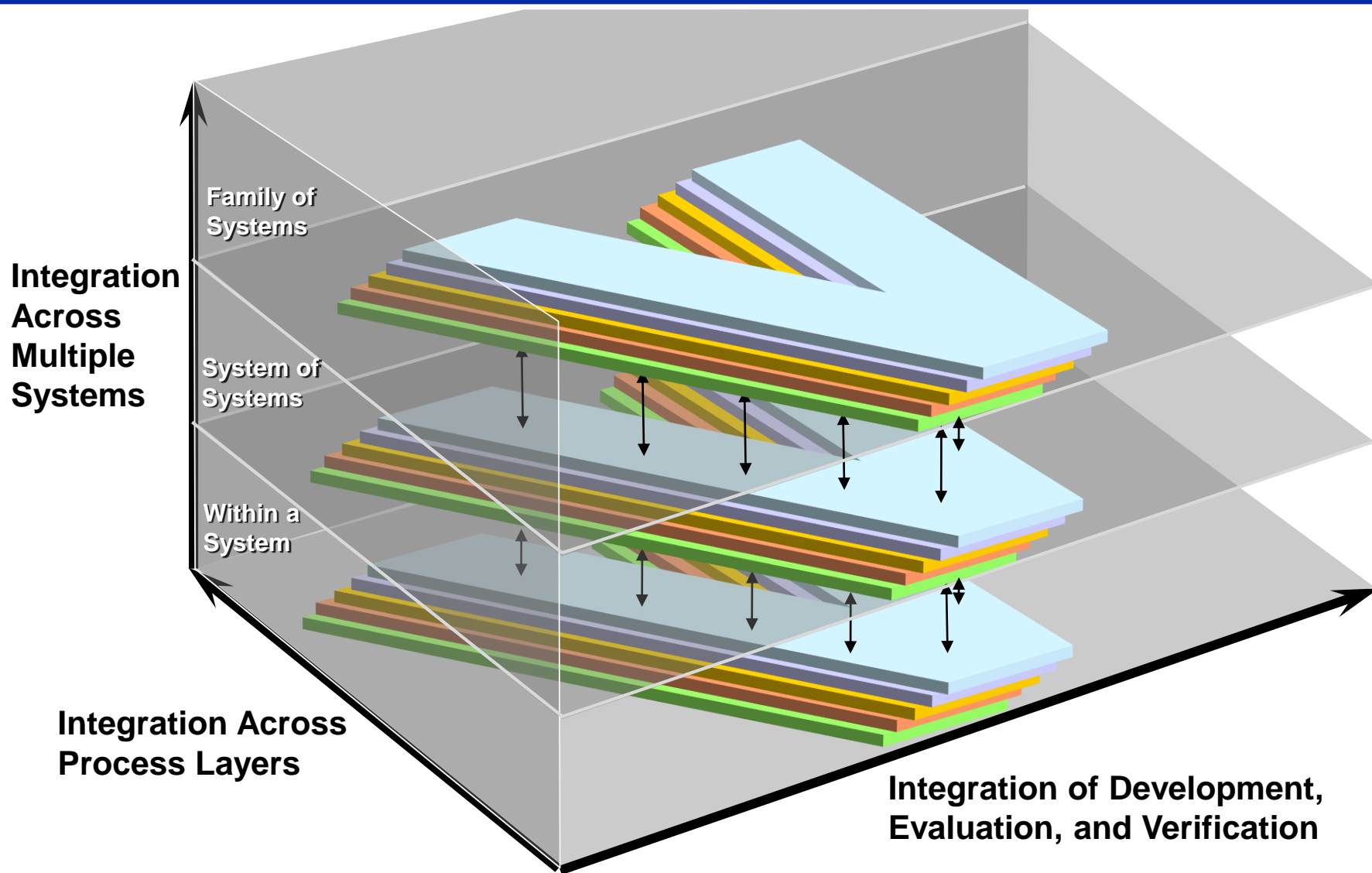
Covered mission areas include: Close air support; Air defense and counter-air; Interdiction; ISR; and other overlapping mission areas of significance

Activities include:

- infrastructure development for engineering, analysis, and test
- tests, demos, exercises, and focused experiments
- overseeing the implementation of section 2446c of title 10, USC
- R&D of tools for composing systems of systems on demand
- developing mission-based inputs requirements, acquisition, and budget processes
- coordinating with COCOMS on CONOPS and OPLANS



Integration Across Multiple Systems





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- Risk Related Statute and Policy to Include Changes
 - NDAA 2017 Independent Technical Risk Assessments
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- **How Are We doing?**



Performance of the Defense Acquisition System 2016 Annual Report

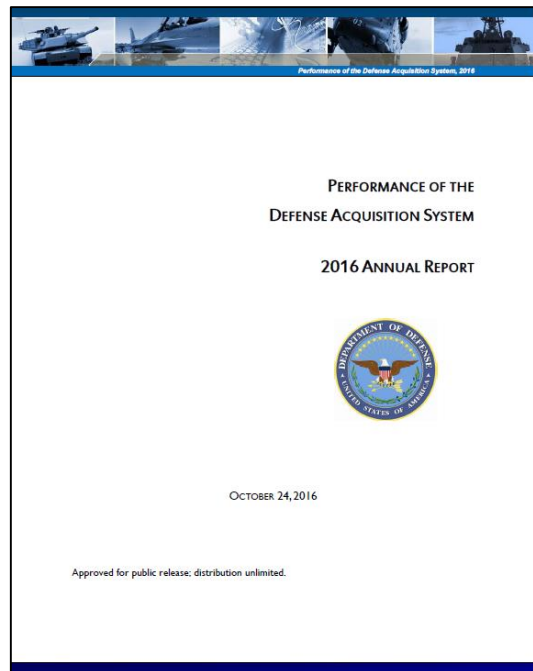
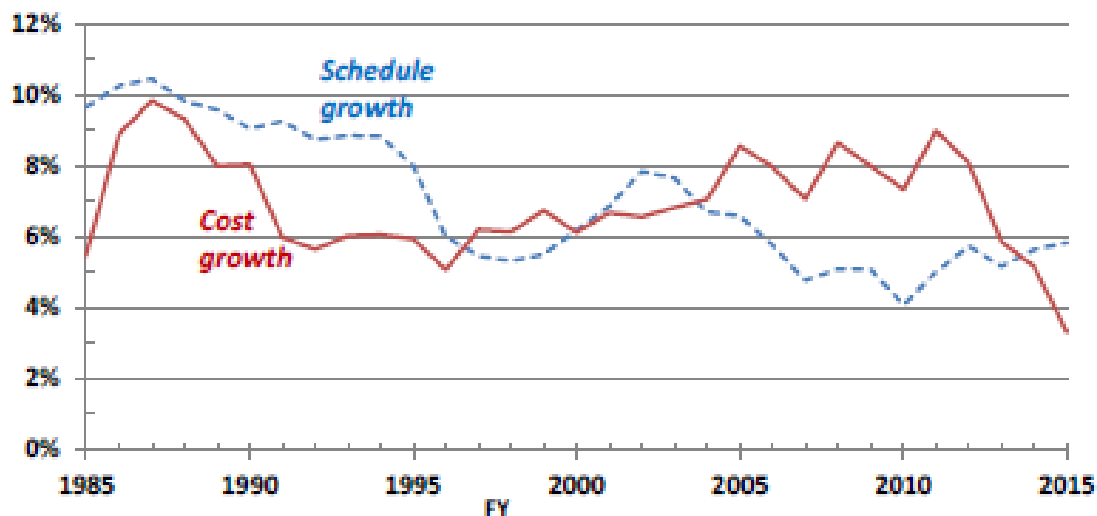


Figure 3-6. Comparing Growth in Schedule and Cost on Major Contracts (FY 1985–2015)

5-Year Moving Average of Annual Growth



NOTE: Spearman's correlation test showed that schedule growth and cost growth are independent (not correlated) over this period. In the BBP era (since 2012), schedule growth is essentially flat, while cost growth has dropped dramatically.

- DoD has moved – and is moving – in the right direction, with regard to cost, schedule, and quality of the products we deliver
- Much more that can be done to improve defense acquisition
- Creating new weapons systems will never be a low risk endeavor
- Risk can be managed and problems that arise can be kept within reasonable bounds

Will always need professionalism, hard work, attention to detail, flexible policies, and incentives



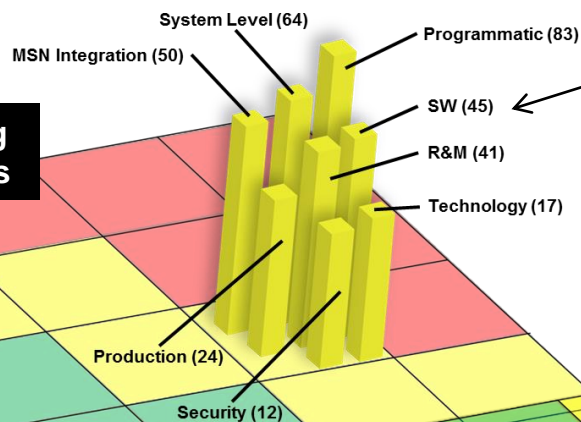
Most Frequent & Critical Risks

Using risk Likelihood and Consequence values

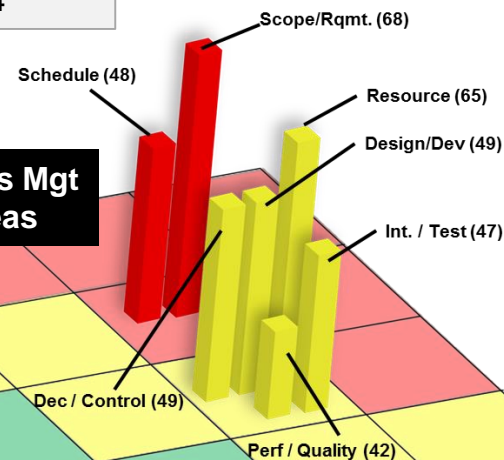
- Use highest risk value within program for given category; e.g. if 2 software risks present for a program risk cube, use the highest L/C value
- Average values across all programs

Read as: 45 of 81 programs had SW as a driver of risk, and on average, the risk scored in the yellow zone of 'likelihood = 3, consequence = 4'

Engineering Focus Areas



Tech Process Mgt Focus Areas



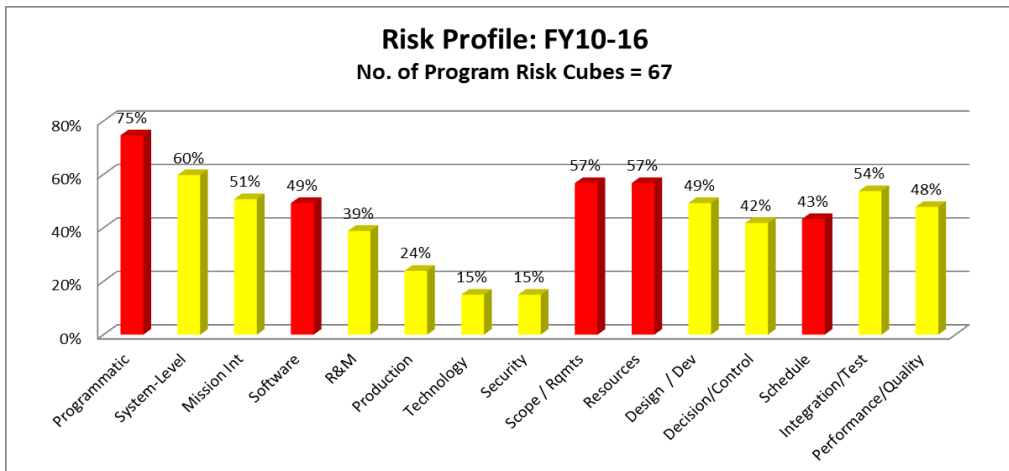
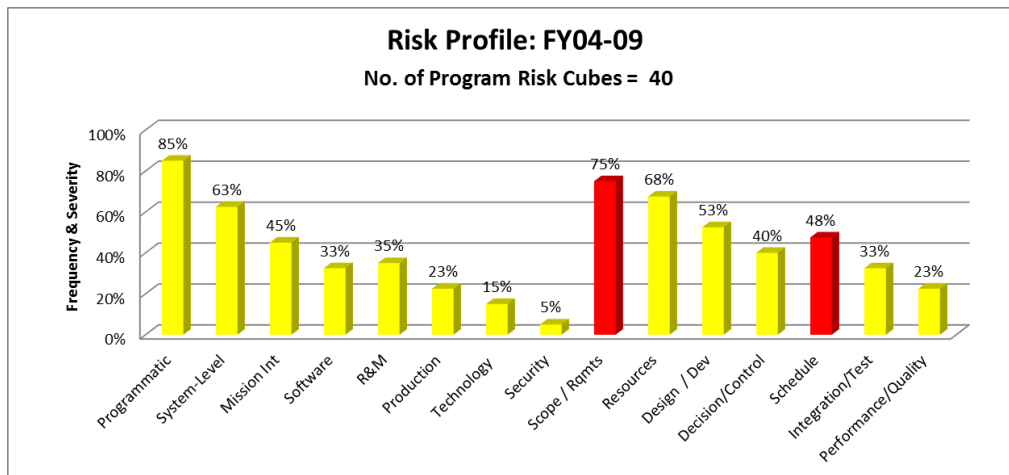
Averaging risk values across programs pushes all risk values to central 'yellow zone' for Engineering focus

N= 81 programs, FY04-16



Most Frequent & Critical Risks

- Time based: “Early vs Recent”



Observations:

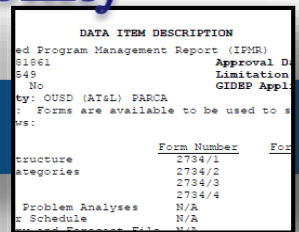
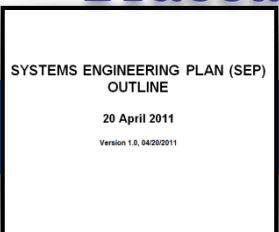
- FY10-16 program risk cubes have 3 additional “RED” categories on average from early program cubes
 - Software
 - Programmatic
 - Resources
- Categories that have approx. 20% different from FY04-09 to FY10-16 are:
 - Performance 25% ↑
 - Integration 21% ↑
 - Scope 18% ↓
 - Software 17% ↑



Schedule Risk Analysis

Traceability

Early Program Planning and Development

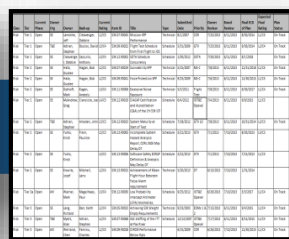
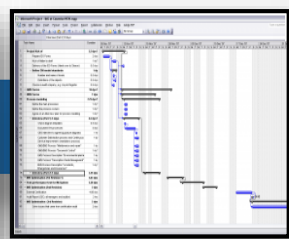
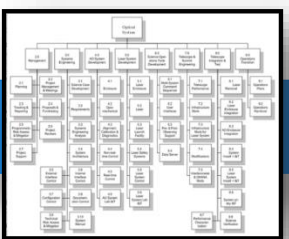


24%
Increase in traceability between RFPs, SEPs & DIDs

Influencing positive program outcomes through early program engagement and development planning

Building Bridges

Continuous Program Engagements



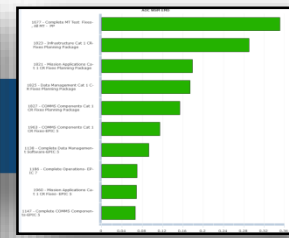
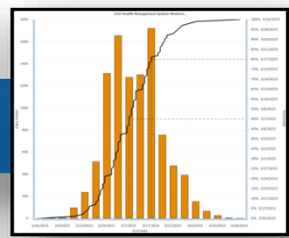
28%
More programs influenced by MPS assessments in FY15

Improved program execution through 96 findings and recommendations!

Benchmarking

Recurring Schedule Analysis

Schedule Health Assessment			
	Total Tasks	Complete Tasks	Incomplete Tasks
Baseline Count	400	250	150
Relationship Count	400	250	150
Relationship Count	400	250	150
#	Metric	Goal	%
1	Logic	100%	100%
2	Logic	100%	100%
3	Logic	100%	100%
4	Relationship Types	100%	100%
5	Relationship Types	100%	100%
6	High Float	100%	100%
7	Negative Float	100%	100%
8	High Duration	100%	100%
9	Invalid Forecast and Actual Dates	100%	100%
10	Resources	100%	100%
11	Mixed Tasks	100%	100%
12	Critical Path Test	100%	100%
13	Critical Path Length Index	100%	100%
14	Baseline Execution Index	100%	100%



38%
More deficiencies isolated in PSAs, PDRs, and CDRs

Improved program schedule realism and influenced decision-making!

Lowering risk across all MDAP programs through a rigorous schedule risk assessment process



Schedule Quality Deficiencies

FY16 Schedule Health Assessments



Assessed 27 Program Schedules

FY16 Schedule Health Assessments																												
#	Metric	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	Missing Logic	2.86%	0.00%	0.25%	0.00%	0.24%	1.19%	0.01%	16.22%	0.04%	0.05%	2.23%	3.31%	0.00%	1.87%	0.00%	0.22%	0.26%	0.57%	1.55%	13.87%	0.00%	16.22%	7.58%	0.00%	2.01%	0.00%	3.07%
2	Leads	0.00%	0.00%	2.01%	0.00%	0.00%	0.00%	0.00%	1.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.50%	0.00%	2.51%	2.51%	2.51%	0.00%	0.00%	0.00%	
3	Lags	10.07%	4.76%	0.59%	2.89%	1.87%	0.00%	3.48%	3.54%	3.41%	18.92%	4.33%	3.45%	2.37%	2.27%	1.00%	1.24%	1.51%	18.99%	0.27%	18.43%	3.00%	4.33%	4.14%	1.11%	0.00%	0.99%	
4	Relationship Types	3.44%	14.29%	4.42%	0.00%	7.18%	0.01%	4.22%	13.44%	4.00%	17.71%	14.44%	17.57%	8.22%	9.22%	14.88%	4.28%	1.20%	12.44%	4.81%	14.24%	16.91%	7.05%	4.66%	0.16%	0.00%	9.71%	
5	Hard Constraints	0.00%	0.00%	2.34%	0.00%	11.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%	2.01%	0.00%	
6	High Float	14.00%	21.00%	14.24%	0.00%	14.32%	17.17%	15.14%	18.21%	17.71%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	15.14%	
7	Negative Float	4.39%	0.00%	10.70%	0.00%	3.77%	0.01%	0.00%	12.64%	0.00%	0.00%	0.00%	12.67%	0.00%	0.00%	13.00%	0.00%	0.00%	7.93%	12.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.21%	
8	High Duration	7.14%	0.00%	0.25%	22.22%	4.48%	10.71%	11.07%	12.64%	7.81%	10.81%	14.44%	7.92%	10.81%	14.44%	11.08%	10.40%	4.24%	12.84%	12.33%	10.00%	1.59%	17.32%	10.00%	24.71%	14.00%	4.11%	
9	Invalid Dates	3.31%	0.00%	2.00%	0.00%	0.00%	11.99%	9.99%	7.00%	1.21%	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
10	Missing Resources	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
11	Missed Tasks	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	
12	Critical Path Test	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	
13	Critical Path Length Index	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	
14	Baseline Execution Index	6.43	98%	81%	84%	92%	7.7	1.00	71%	100%	8%	32%	47%	34%	48%	44%	0.99	49%	73%	37%	6.44	64%	6.44	98%	117%	100.0%	100%	

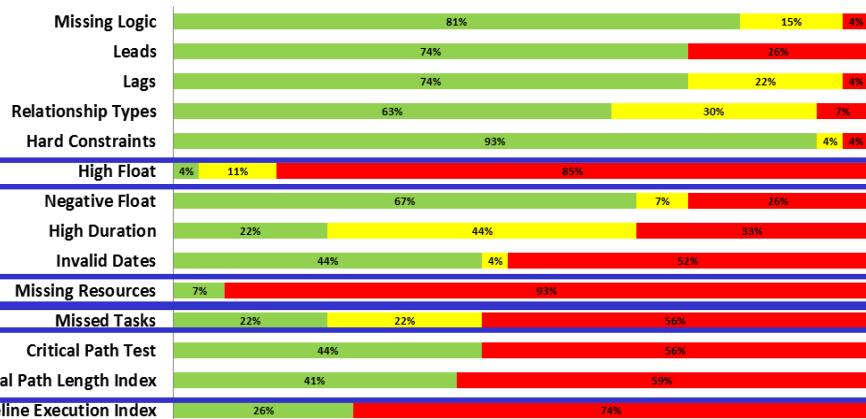
Source of color coding: DCMA IMS Assessment Guide



Metrics Summary

27 Schedule Health Assessments in FY16

Green Yellow Red



Top three areas of schedule improvement

- 7% increase in programs with resources loaded.
- 19% decrease in programs with missed tasks exceeding DCMA threshold.
- 10% decrease in programs with high float exceeding DCMA threshold.

Top four deficiencies

- 85% of programs have **high float** exceeding 20% of remaining tasks indicating deficiencies related to technical accomplishment and scope.
- 93% of programs have **missing resources** to track hours and/or dollars needed to properly support all scope.
- 56% of programs have **missed tasks** exceeding 20% signaling that the baseline plan may be inadequately resourced or the plan is unrealistic and overly optimistic.
- 74% of programs have a **Baseline Execution Index (BEI)** below 95% indicating that tasks are not completing as baselined planned.



Closing

Weapon Systems Development and Acquisition



- Developing weapons systems will never be a low risk endeavor
- Risk can be managed and can be kept within reasonable bounds
- DoD has moved – and is continuing to move – in the right direction, with regard to cost, schedule, and quality of the products we deliver

Proactive Risk Management – Critical to Meeting Warfighter Needs

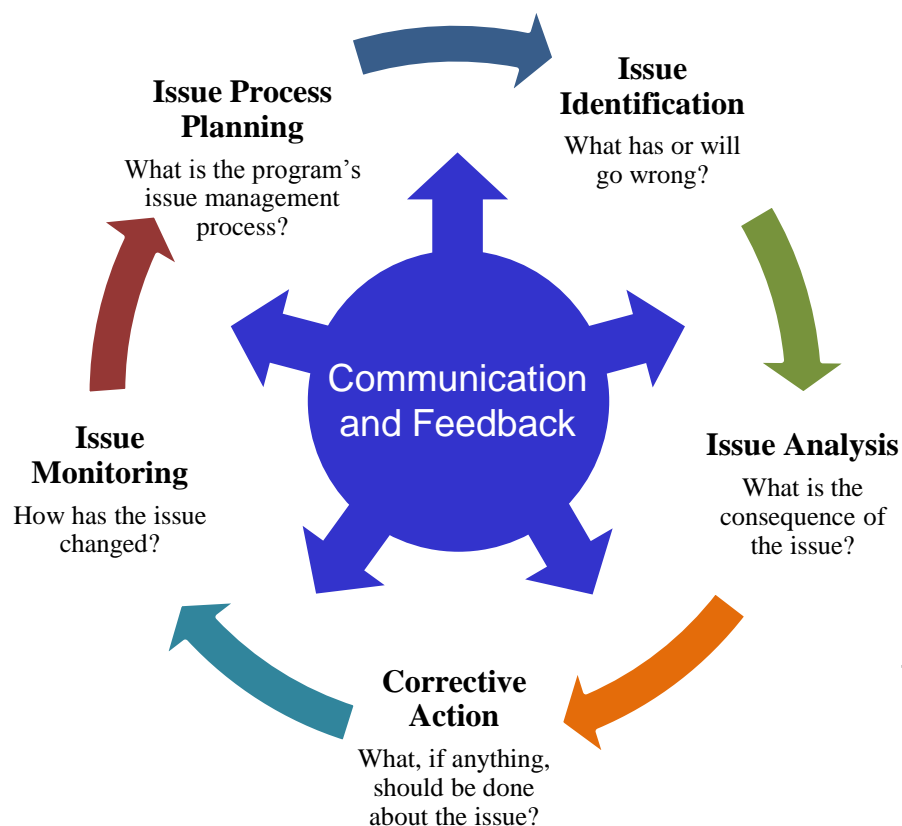


Backup



Issue Management

Issue: event or condition with negative effect that has occurred (such as a realized risk) or is certain to occur (probability = 1).



Level	Cost	Schedule	Performance
3 Critical Impact	10% or greater increase over APB objective values for KDFAE, PAUC, or APUC. Cost increase causes program to exceed affordability caps	Schedule slip will require a major schedule reworking. Precludes program from meeting its APB schedule threshold dates	Degradation precludes system from meeting a KPP or key technical supportability threshold, will jeopardize program success ² Unable to meet mission objectives (defined in mission threads, ConOps, OMS/MP)
4 Significant Impact	1% - <10% increase over APB objective values for KDFAE, PAUC, or APUC. Costs exceed life cycle ownership cost KSA	Schedule deviations will slip program to within 2 months of approved APB threshold schedule date Schedule slip puts funding at risk Fielding of capability to operational units delayed by more than 6 months ¹	Degradation impairs ability to meet a KSA. ³ Technical design or supportability margins exhausted in key areas Significant performance impact affecting System of System interdependencies. Work-arounds required to meet mission objectives
3 Moderate Impact	1% - <5% increase over APB objective values for KDFAE, PAUC, or APUC. Manageable with PEO or Service assistance	Can meet APB objective schedule dates, but other non-APB key events (e.g., SETRs or other Tier 1 Schedule events) may slip Schedule slip impacts synchronization with interdependent programs by greater than 2 months	Unable to meet lower tier ambates, TPMs, or CTPs Design or supportability margins reduced Miss performance impact affecting System of System interdependencies. Work-arounds required to achieve mission tasks
2 Minor Impact	Costs that drive unit production cost (e.g., APUC) increase of <1% over budget Cost increase, but can be managed internally	Some schedule slip, but can meet APB objective dates and non-APB key event dates	Reduced technical performance or supportability, can be tolerated with little impact on program objectives Design margins reduced, within trade space ²
1 Minimal Impact	Minimal impact. Costs expected to meet approved funding levels	Minimal schedule impact	Minimal consequences to meeting technical performance or supportability requirements. Design margins will be met, margins to planned timelines

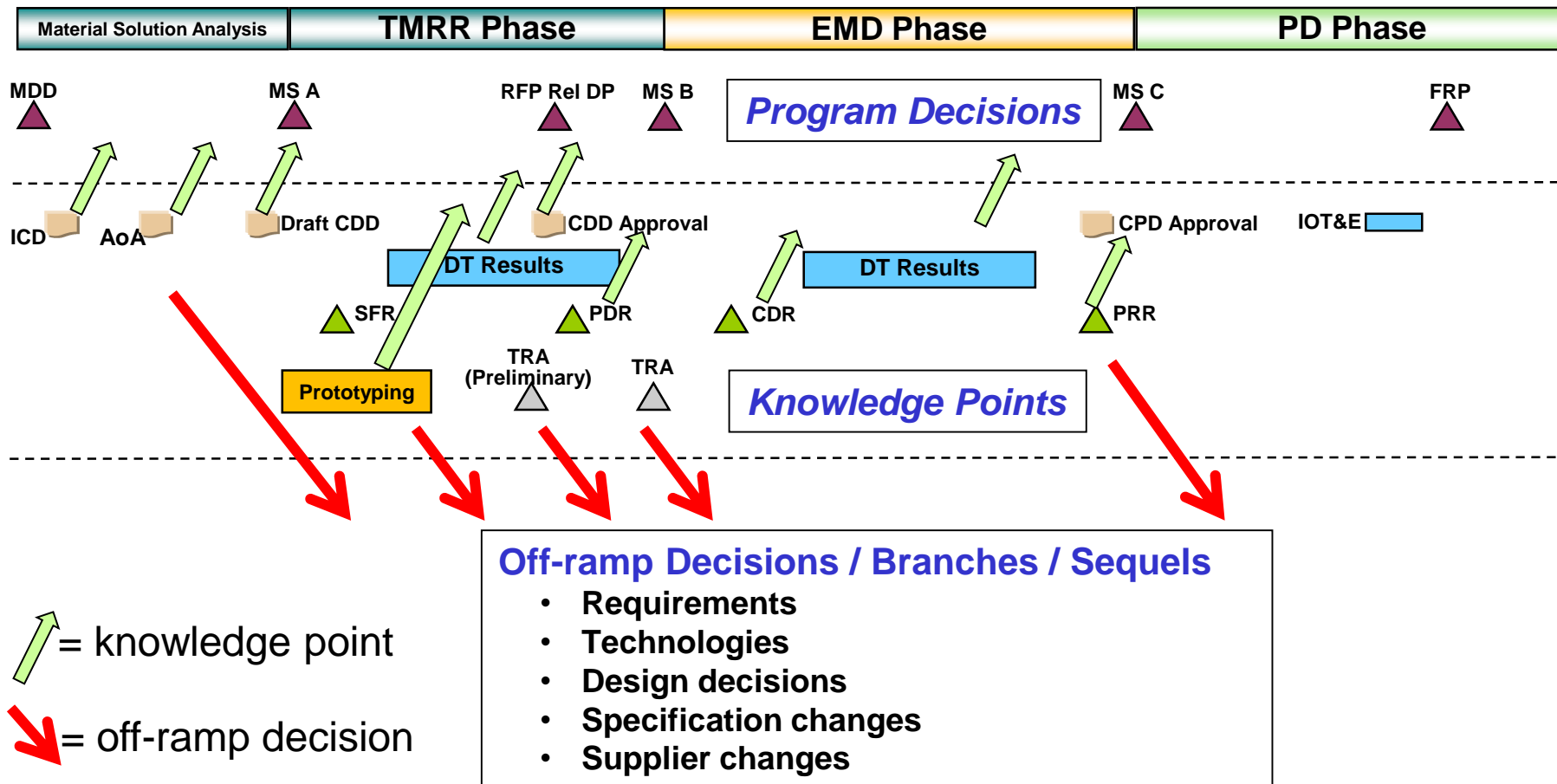
Notes:
¹ Consider fielding of capability to interdependent programs as well.
² Failure to meet TPMs or CTPs directly derived from KPPs or KSAs are indicators of potentially not meeting a KPP or KSA

Corrective Action options:

- **Ignore:** Accept the consequences without further action based on results of a cost/ schedule/ performance business case analysis
- **Control:** Implement a plan to reduce issue consequences and residual risk to as low a level as practical or minimize impact on the program.



Knowledge Points and Off-Ramps



Planning for knowledge and information with which to make off-ramp or branch/sequel decisions based on that knowledge



FY 2016 NDAA Acquisition Strategy Risk Management Guidance (Sec 822, § 2431b.)



“(a) REQUIREMENT.—The Secretary of Defense shall ensure that the **initial acquisition strategy** (required under section 2431a of this title) approved by the milestone decision authority **and any subsequent revisions** include the following:

“(1) **A comprehensive approach for managing and mitigating risk (including technical, cost, and schedule risk)** during each of the following periods or when determined appropriate by the milestone decision authority:

“(A) The period preceding engineering manufacturing development, or its equivalent.

“(B) The period preceding initial production.

“(C) The period preceding full-rate production.

“(2) **An identification of the major sources of risk** in each of the periods listed in paragraph (1) to improve programmatic decision making and appropriately minimize and manage program concurrency.

“(b) APPROACH TO MANAGE AND MITIGATE RISKS.—The comprehensive approach to manage and mitigate risk included in the acquisition strategy for purposes of subsection (a)(1) **shall**, at a minimum, **include consideration of risk mitigation techniques such as the following**:



FY 2016 NDAA Acquisition Strategy Risk Management Guidance (Sec 822, § 2431b.)



- “(1) **Prototyping** (including prototyping at the system, subsystem, or component level and competitive prototyping, where appropriate) and, if prototyping at either the system, subsystem, or component level is not used, an explanation of why it is not appropriate.
- “(2) **Modeling and simulation**, the areas that modeling and simulation will assess, and identification of the need for development of any new modeling and simulation tools in order to support the comprehensive strategy.
- “(3) **Technology demonstrations and decision points** for disciplined transition of planned technologies into programs or the selection of alternative technologies.
- “(4) **Multiple design approaches.**
- “(5) **Alternative designs**, including any designs that meet requirements but do so with reduced performance.
- “(6) **Phasing of program activities or related technology development efforts in order to address high-risk areas as early as feasible.**
- “(7) **Manufacturability and industrial base availability.**
- “(8) **Independent risk element assessments by outside subject matter experts.**
- “(9) **Schedule and funding margins** for identified risks.



FY 2017 NDAA – Program Cost, Fielding, and Performance Goals (Sec 807, § 2448a)



(a) Program Cost and Fielding Targets.—

(1) Before funds are obligated for technology development, systems development, or production of a major defense acquisition program, the Secretary of Defense shall ensure, by establishing the goals described in paragraph (2), that the milestone decision authority for the major defense acquisition program approves a program that will—

- (A) be affordable;
- (B) incorporate program planning that anticipates the evolution of capabilities to meet changing threats, technology insertion, and interoperability; and
- (C) be fielded when needed.

(2) The goals described in this paragraph are goals for—

- (A) the procurement unit cost and sustainment cost (referred to in this section as the ‘program cost targets’);
- (B) the date for initial operational capability (referred to in this section as the ‘fielding target’); and
- (C) technology maturation, prototyping, and a modular open system approach to evolve system capabilities and improve interoperability.



FY 2017 NDAA – Independent Technical Risk Assessments (Sec 807, § 2448b)



Independent technical risk assessments

(a) IN GENERAL.—With respect to a major defense acquisition program, the Secretary of Defense shall ensure that an independent technical risk assessment is conducted—

- (1) before any decision to grant Milestone A approval for the program pursuant to section 2366a of this title, that identifies critical technologies and manufacturing processes that need to be matured; and
- (2) before any decision to grant Milestone B approval for the program pursuant to section 2366b of this title, any decision to enter into low-rate initial production or full-rate production, or at any other time considered appropriate by the Secretary, that includes the identification of any critical technologies or manufacturing processes that have not been successfully demonstrated in a relevant environment.

(b) CATEGORIZATION OF TECHNICAL RISK LEVELS.—The Secretary shall issue guidance and a framework for categorizing the degree of technical and manufacturing risk in a major defense acquisition program.”.

(2) EFFECTIVE DATE.—Subchapter III of chapter 144B of title 10, United States Code, as added by paragraph (1), shall apply with respect to *major defense acquisition programs that reach Milestone A after October 1, 2017.*



NDAA 2017 Section 855

Mission Integration Management



SEC. 855. MISSION INTEGRATION MANAGEMENT.

- (a) **IN GENERAL.**—The Secretary of Defense shall establish mission integration management activities for each mission area specified in subsection (b).
- (b) **COVERED MISSION AREAS.**— The mission areas specified in this subsection are mission areas that involve multiple Armed Forces and multiple programs and, at a minimum, include the following:
 - (1) Close air support.
 - (2) Air defense and offensive and defensive counter-air.
 - (3) Interdiction.
 - (4) Intelligence, surveillance, and reconnaissance.
 - (5) Any other overlapping mission area of significance, as jointly designated by the DepSecDef and the VCJCS
- (c) **QUALIFICATIONS.**—Mission integration management activities shall be performed by qualified personnel from the acquisition and operational communities.
- (d) **RESPONSIBILITIES.**—The mission integration management activities for a mission area under this section shall include—
 - (1) development of technical infrastructure for engineering, analysis, and test, including data, modeling, analytic tools, etc.
 - (2) the conduct of tests, demonstrations, exercises, and focused experiments for compelling challenges and opportunities;
 - (3) overseeing the implementation of section 2446c of title 10, United States Code;
 - (4) sponsoring and overseeing research on and development of automated tools for composing systems of systems on demand;
 - (5) developing mission-based inputs for the requirements process, assessment of concepts, prototypes, design options, budgeting and resource allocation, and program and portfolio management; and
 - (6) coordinating with commanders of the COCOMS on the development of concepts of operation and operational plans.
- (e) **SCOPE.**—The mission integration management activities for a mission area under this subsection shall extend to the supporting elements for the mission area, such as communications, command and control, electronic warfare, and intelligence.
- (f) **FUNDING.**—There is authorized to be made available annually such amounts as the Secretary of Defense determines appropriate from the Rapid Prototyping Fund established under section 804(d) of the National Defense Authorization Act for Fiscal Year 2016
- (g) **STRATEGY.**—The Secretary of Defense shall submit to the congressional defense committees, at the same time as the budget for the Department of Defense for fiscal year 2018 is submitted to Congress pursuant to section 1105 of title 31, U.S. Code, a strategy for mission integration management



10 USC 2446c: Requirements relating to availability of major system interfaces and support for modular open system approach



§2446c. Requirements relating to availability of major system interfaces and support for modular open system approach

The Secretary of each military department shall-

- (1) coordinate with the other military departments, the defense agencies, defense and other private sector entities, national standards-setting organizations, and, when appropriate, with elements of the intelligence community with respect to the specification, identification, development, and maintenance of major system interfaces and standards for use in major system platforms, where practicable;**
- (2) ensure that major system interfaces incorporate commercial standards and other widely supported consensus-based standards that are validated, published, and maintained by recognized standards organizations to the maximum extent practicable;**
- (3) ensure that sufficient systems engineering and development expertise and resources are available to support the use of a modular open system approach in requirements development and acquisition program planning;**
- (4) ensure that necessary planning, programming, and budgeting resources are provided to specify, identify, develop, and sustain the modular open system approach, associated major system interfaces, systems integration, and any additional program activities necessary to sustain innovation and interoperability; and**
- (5) ensure that adequate training in the use of a modular open system approach is provided to members of the requirements and acquisition workforce.**

Effective Date: Section effective Jan. 1, 2017, see section 805(a)(4) of Pub. L. 114–328, set out as a note under section 2446a of this title.