RISK MANAGEMENT OVERVIEW

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EXPECTATIONS

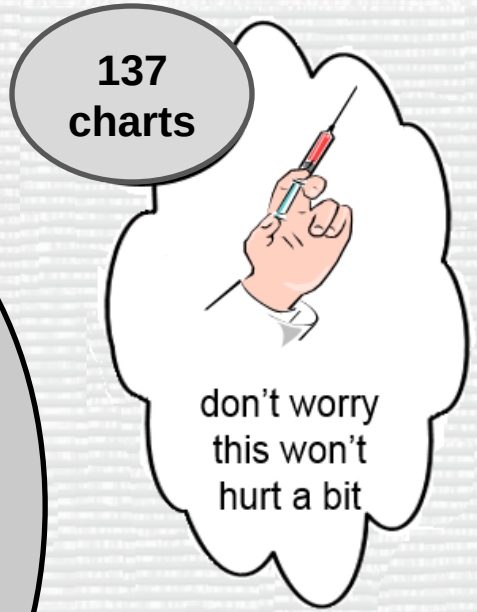
- DoD Risk Management Guidance

- Risk Management
  - Risk Planning
  - Risk Identification
  - Risk Analysis
  - Risk Handling
  - Risk Monitoring

- Issue Management
- Opportunity Management

- DAU Risk Management Workshop

Charts contain a lot of detail which is NOT intended to be digested, rather available for deeper discussion or reference.



QUOTES FROM AT&L

- Our task as managers involves optimization—what are the highest-payoff **risk-mitigation investments** we can make with the resources available?
- I expect our managers to demonstrate that they have **analyzed** this problem and made good judgments about how best to use the resources they have to **mitigate** the program's **risk**.

From the Under Secretary of Defense for Acquisition, Technology, and Logistics

Risk and Risk Mitigation—Don't Be a Spectator

Frank Kendall

DODI 5000.02 7JAN15

incorporating Change 2, 2 Feb 2017

Enclosure 2. PROGRAM MANAGEMENT RESPONSIBILITIES.

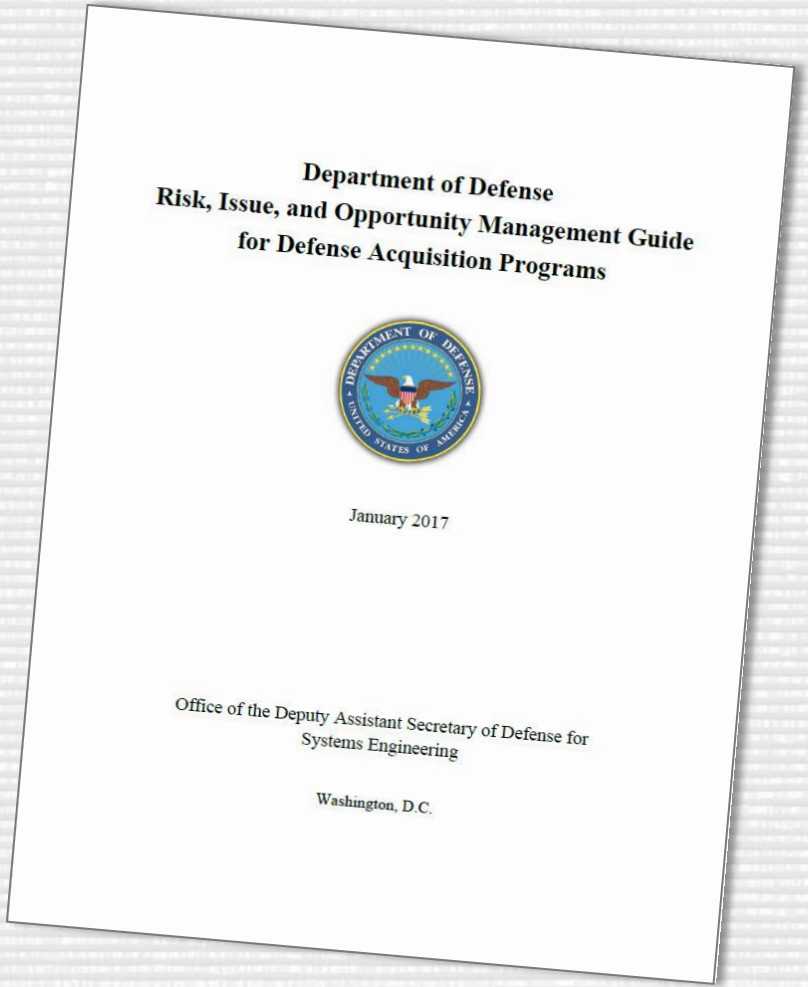
d. Risk Management

(1) The Program Manager is responsible for implementing effective risk management and tracking to include the identification of all known risks, key assumptions, probability of occurrence, consequences of occurrence (in terms of cost, schedule, and performance) if not mitigated, analysis of mitigation options, decisions about actions to mitigate risk, and execution of those actions.

Risk management is proactive and should be focused on the actions that will be taken and resources that will be allocated to reduce both the likelihood and consequences of risks being realized. Effective risk management is not just risk identification and tracking.

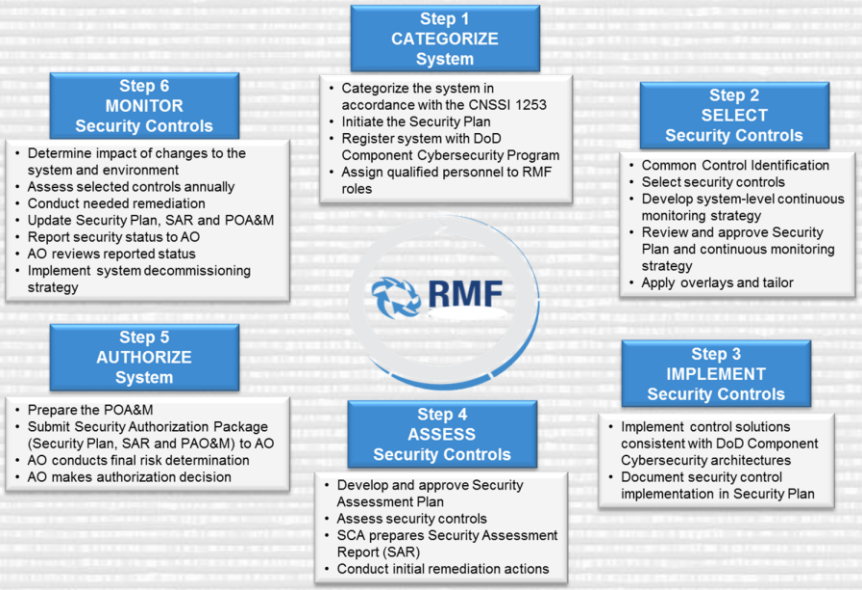
DOD RIOM GUIDE

- Significantly different from DoD Risk Management Guide, Version 6.0, 2005
- Version 7.0 Published INTERIM in December 2014
- Significantly revised and extended to incorporate comments from the Services, Agencies and DAU
- DRAFT (not for distribution) released for further edit May 2015
- Final Publication of Risk, Issue, and Opportunity Management Guide for Defense Acquisition Programs: June 2015
- Updated and republished January 2017



WHAT RIOM IS NOT…

Cybersecurity



DoD Instruction 8510.01, "Risk Management Framework (RMF) for DoD Information Technology (IT)," March 12, 2014, *as amended*

System Safety

RISK ASSESSMENT MATRIX

SEVERITY / PROBABILITY	Catastrophic (1)	Critical (2)	Marginal (3)	Negligible (4)
Frequent (A)	High	High	Serious	Medium
Probable (B)	High	High	Serious	Medium
Occasional (C)	High	Serious	Medium	Low
Remote (D)	Serious	Medium	Medium	Low
Improbable (E)	Medium	Medium	Medium	Low
Eliminated (F)	Eliminated			

Military-Standard 882E, "DoD Standard Practice for System Safety," May 11, 2012

Risk Management Overview

RISK MANAGEMENT

**“Bad news isn’t wine.
It doesn’t improve with age.”**

Colin Powell

“If you don’t actively attack the risks, they will actively attack you.”

Principles of Software Engineering Management **Tom Gilb**

RISK MANAGEMENT – EVERYONE'S JOB!

Risk Management Overview

The practice of risk management constitutes a significant aspect of program management and draws from all disciplines, including systems engineering, use of models and simulation, requirements definition, developmental and operational test, earned value management (EVM), production planning, quality assurance, and logistics.

Risk management needs to be both top-down (program leadership) and bottom-up (from working-level staff members) to be successful.

DoD Risk, Issue, and Opportunity Management Guide January 2017

RISK MANAGEMENT OBSTACLES

Culture often precludes risk management

- I know what I'm doing….

Going through the motions vs. an Integral process

- Time for another quarterly brief….

Management and organizations fear risk identification

- It's not my fault
- If I don't know,… then no one can blame me

Issues vs. risks – they are not the same

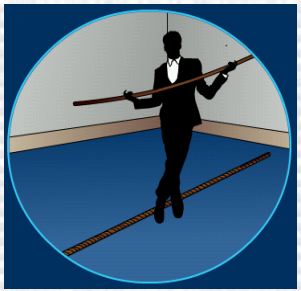
- I just lost $2M in the budget review!

Process is not supported by infrastructure

- Who is in charge of risk management?

RISK DEFINITION

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



Risks are defined by

(1) the probability (greater than 0, less than 1) of an undesired event or condition and

(2) the consequences, impact, or severity of the undesired event, were it to occur.

SOUND RISK MANAGEMENT

- Helps identify and anticipate problems
- Provides for sufficient response time
- Eliminates many surprises
- Provides pro-active approach
- Prevents loss of: revenue, time and mission success

One risk-mitigation rule of thumb for program planning is to do the hard things first.

Hon. Frank Kendall, USD/AT&L

MORE AT&L QUOTES ON RISK

Risk management is not a passive activity, and proactive risk-management investments are not free.

- Those investments, however, can be the most important resource allocations we make in our programs.
- As managers, we need to attack risk the way we've been attacking cost. Understand risk thoroughly, and then go after the risk items with the highest combined likelihoods and consequences and bring them under control.
- Allocate your scarce resources so you achieve the highest possible return for your investments in risk reduction.
- Do this most of all at the very start of program planning.

The course set then will determine the direction of the balance of the program and whether it succeeds or fails.

Hon. Frank Kendall, USD/AT&L
2015

DOD RIOM 2015 CONTENT

Section 1: Introduces the scope and changes

Section 2: Describes planning & documentation of program's risk management process.

Section 3: 5-step risk management process: planning, identification, analysis, handling, and monitoring

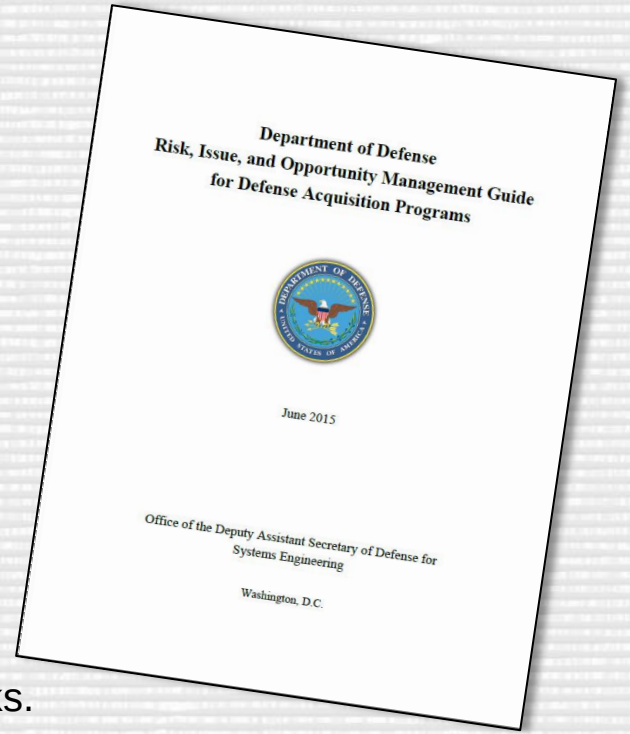
Section 4: Integrating risk management with other program management tools e.g. WBS, IMP, IMS. Metrics e.g. SRA, CRA, PRA, and TPMs.

Section 5: Issue Management - differentiates between Risk and Issue Management

Section 6: Opportunity Management

Section 7: Internal and external interfaces with interdependent programs and cross-program risks.

Appendixes: Life Cycle Considerations, Activities, Templates, Roles, Responsibilities & Relationships; Risk Management Vignette



DoD Risk, Issue, and Opportunity Management Guide June 2015

DOD RIOM 2017 CONTENT

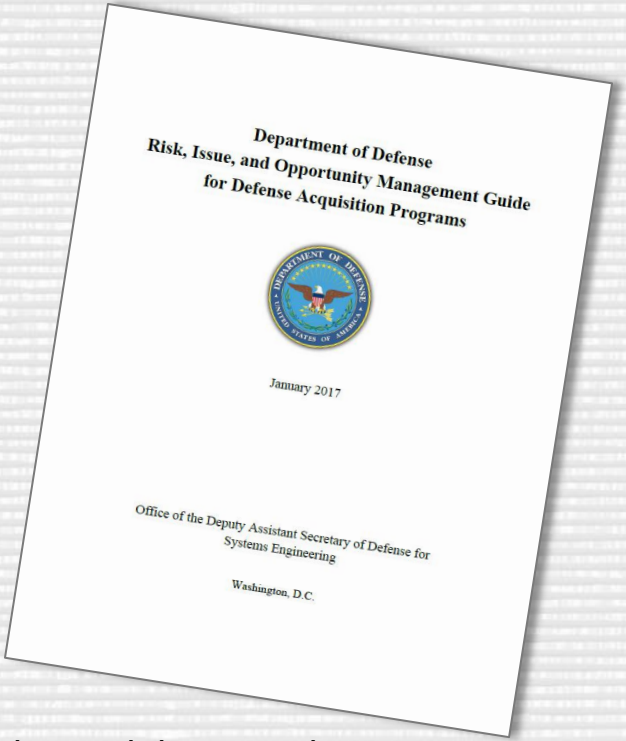
Section 1: Introduces the scope and overview of the guide.

Section 2: Describes how risk informs the decisions shaping a program acquisition strategy and structure, and the most important activities to manage risk by life cycle phase.

Section 3: Describes how a program manages risks and issues by developing plans to reduce the consequences and/or the likelihood of the risks or issues.

Section 4: Describes opportunity management, including the similarities and differences between opportunity and risk management.

Section 5: Highlights considerations to manage risks related to internal and external interfaces with interdependent programs. Discusses the different priorities of interdependent programs and techniques to manage and mitigate cross-program risks.


Department of Defense
Risk, Issue, and Opportunity Management Guide
for Defense Acquisition Programs

January 2017

Office of the Deputy Assistant Secretary of Defense for
Systems Engineering

Washington, D.C.

Appendixes: Appendix A provides additional information on establishing and documenting a Program Risk Process (PRP). Appendix B discusses integrating risk management with other program management and systems engineering tools, and Appendix C provides a vignette illustrating how a program might address a particular risk.

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RISKS AND ISSUES

Risks: Future Problems: Focus is on Future Consequences and Likelihood

- Can be “closed” only after successful mitigation through avoiding, controlling, transferring, or accepting (assuming) the risk
- Examples:
  - IF the sole source provider of a critical component goes out of business, THEN the program will be delayed by 6 months
  - IF proprietary interfaces are used, THEN maintenance and support costs will likely increase as the program matures

Issues: Current Problems: Focus is on Real-Time Consequences

- If the probability of occurrence is “near certainty” or if it has already occurred, it’s an issue
- Examples:
  - Release of engineering drawings is behind schedule
  - Test failure of components reveals a design shortfall

If it has already occurred, it’s an ISSUE, not a RISK

SUCCESSFUL RISK MANAGEMENT

Successful risk management requires thoughtful planning and resourcing, and should be implemented as early as possible in the life cycle The goal is to identify risks to inform decisions and handling strategies before they become issues.

RISK or ISSUE ?

RISK
or
ISSUE ?

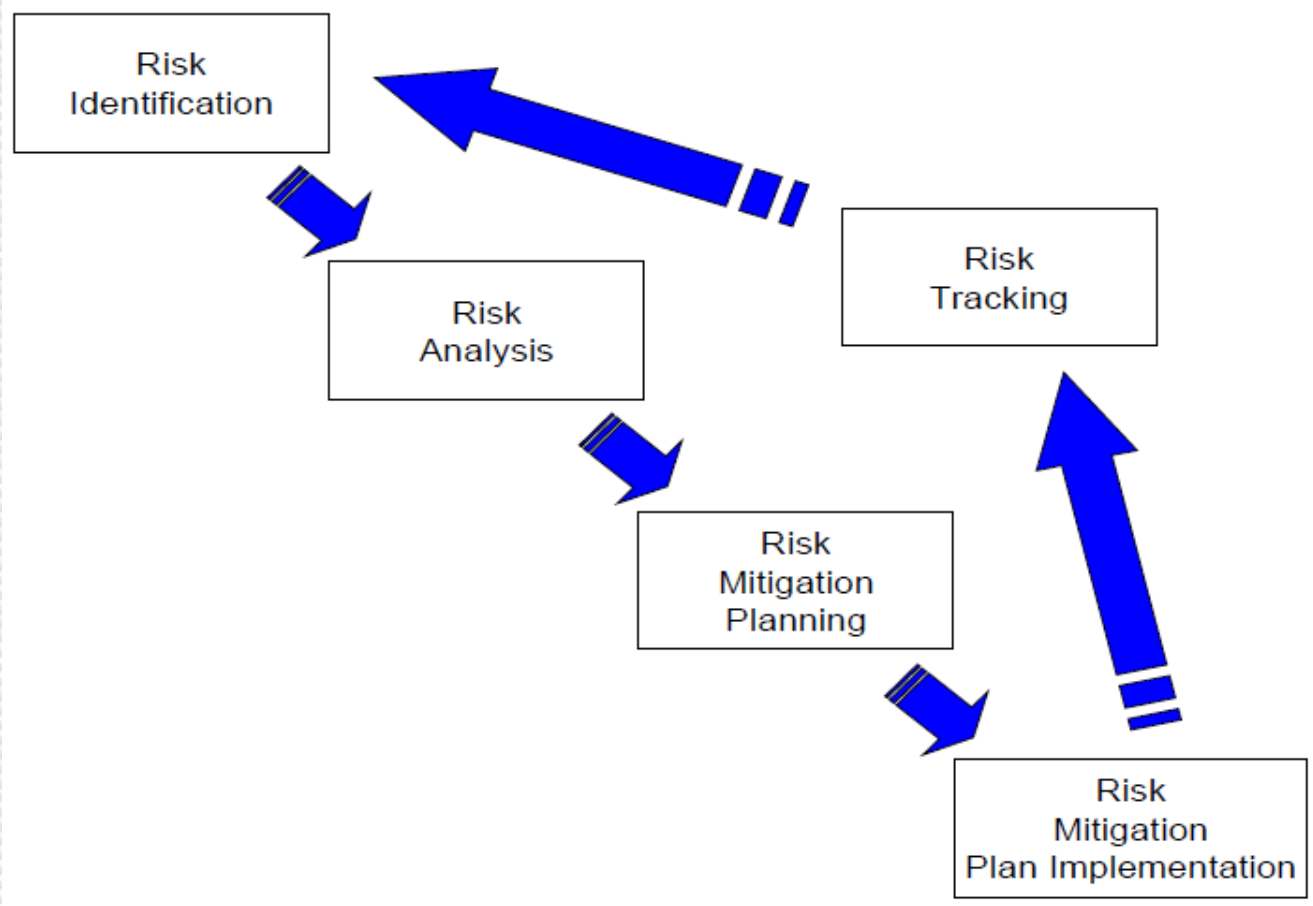
RISK MANAGEMENT APPROACH

It is essential that programs define, implement, and document an appropriate risk management approach that is organized, comprehensive, and iterative by addressing the following questions:

★ Changes from previous language

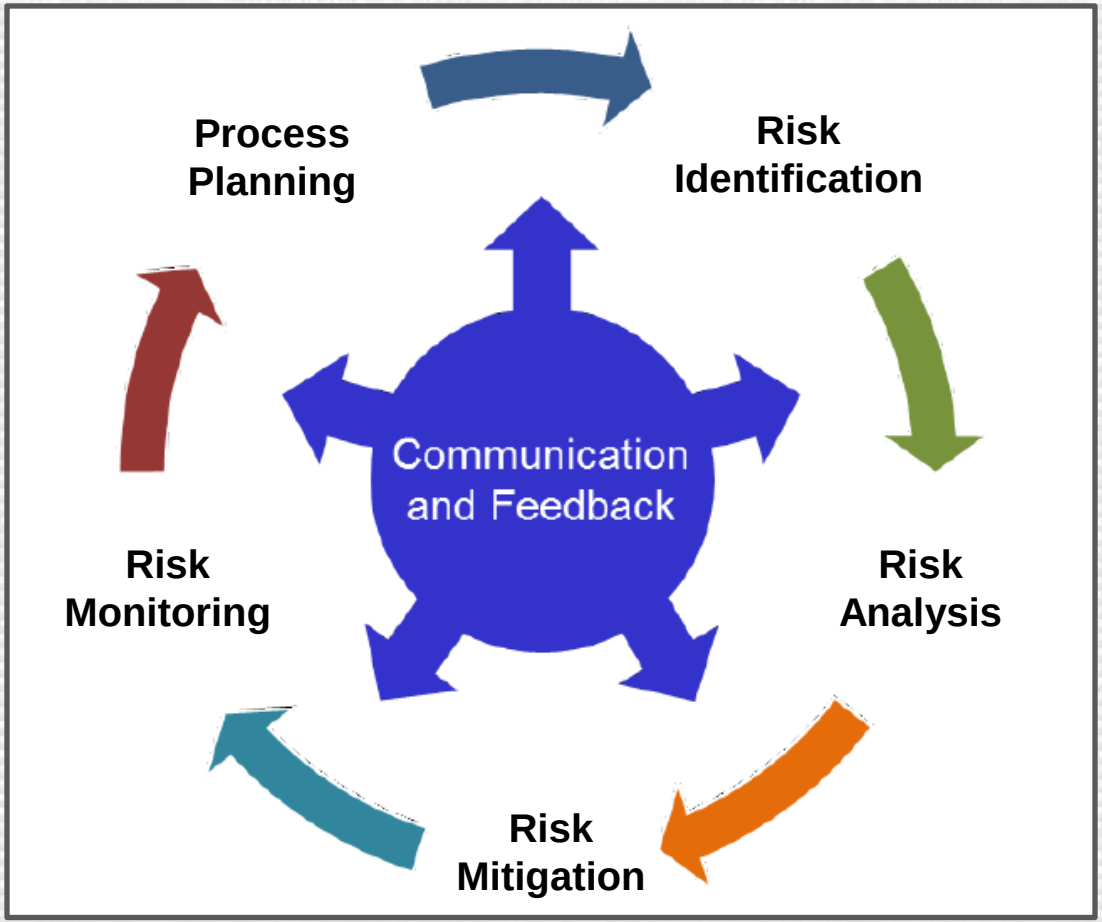
- Risk Planning: What is the program's risk mitigation process?
- Risk Identification: What can go wrong?
- Risk Analysis: What are the likelihood and consequence of the risk?
- Risk Mitigation (Handling): Should the risk be mitigated? If so, how?
- Risk Monitoring (Tracking): How has the risk changed?

2005 RISK MANAGEMENT APPROACH



DOD Risk Management Guide 6th Edition, Aug 2005

2017 RISK MANAGEMENT APPROACH



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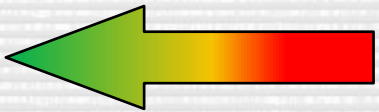
ALTERNATIVE TO RISK MANAGEMENT

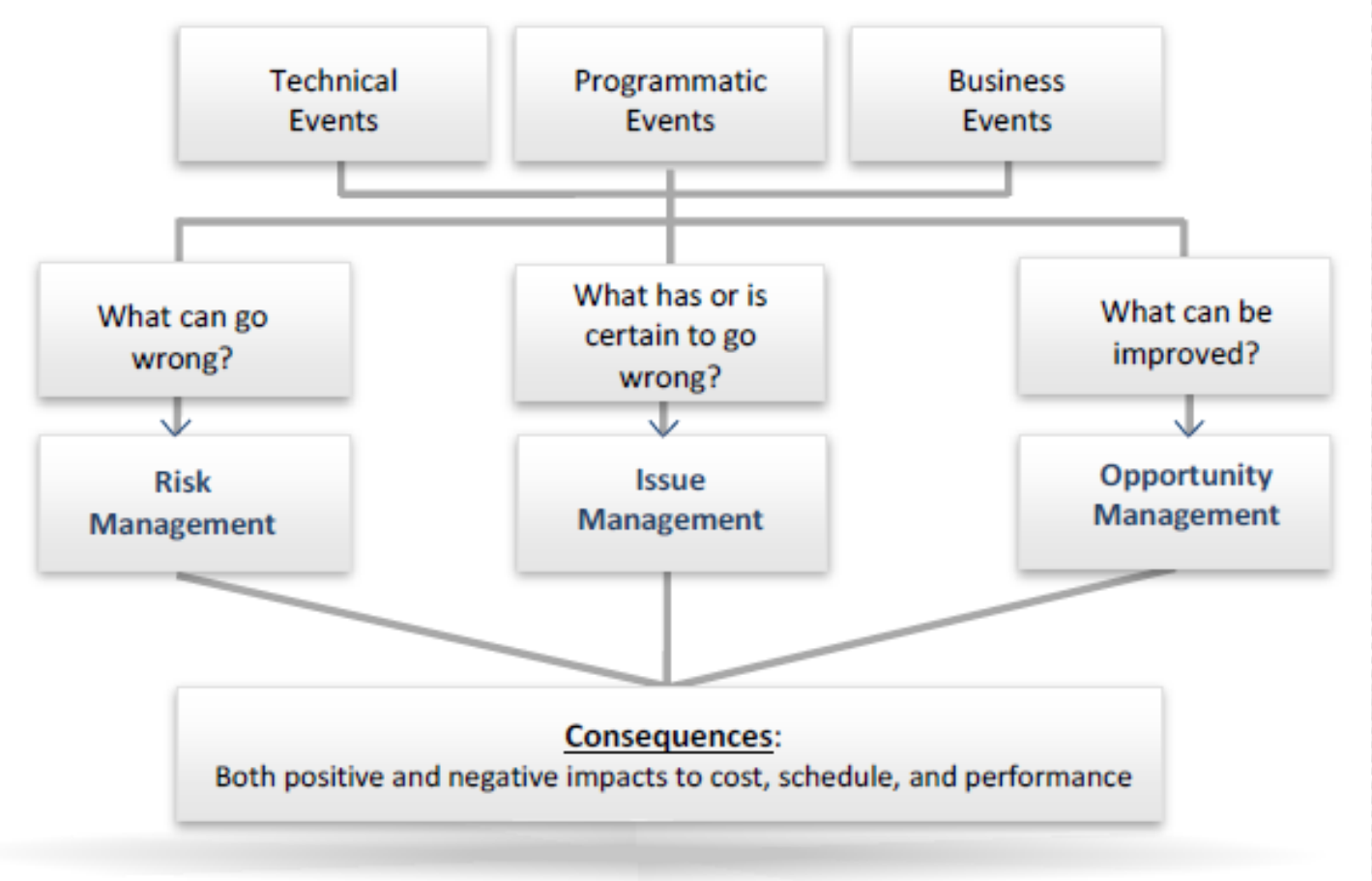
Risk Management vs. Crisis Management

Risk Management	Crisis Management
Proactive	Reactive
Preventive	Corrective
Preplanned	Unplanned
Pay Now	Pay More Later
Take Control	Hope for the Best Problem Solving



The goal: Move left and minimize surprises!

RISK, ISSUE, AND OPPORTUNITY RELATIONSHIP



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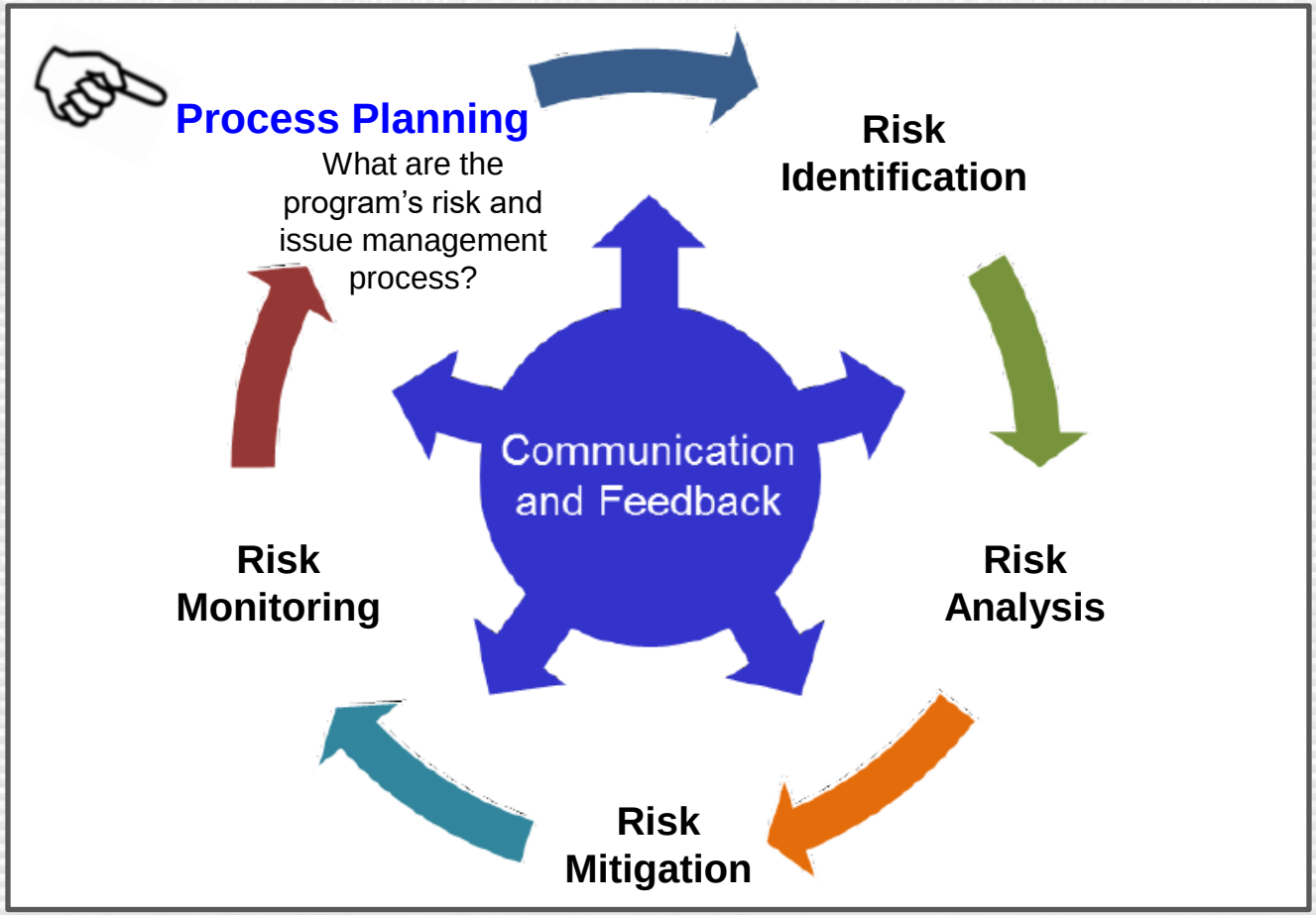
Process Planning

"Plans are nothing…
planning is everything" DDE

RISK PLANNING

DoD Risk, Issue, and Opportunity Management Guide June 2015

PROCESS PLANNING



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PROCESS PLANNING

The most important decisions to control risk are made early in a program life cycle. PMs and teams must understand the capabilities under development and perform a detailed analysis to identify the key risks.

- requirements
- product concept
- program structure
- acquisition strategy
- acquisition phase
- technology maturity
- competitive prototypes
- test approach

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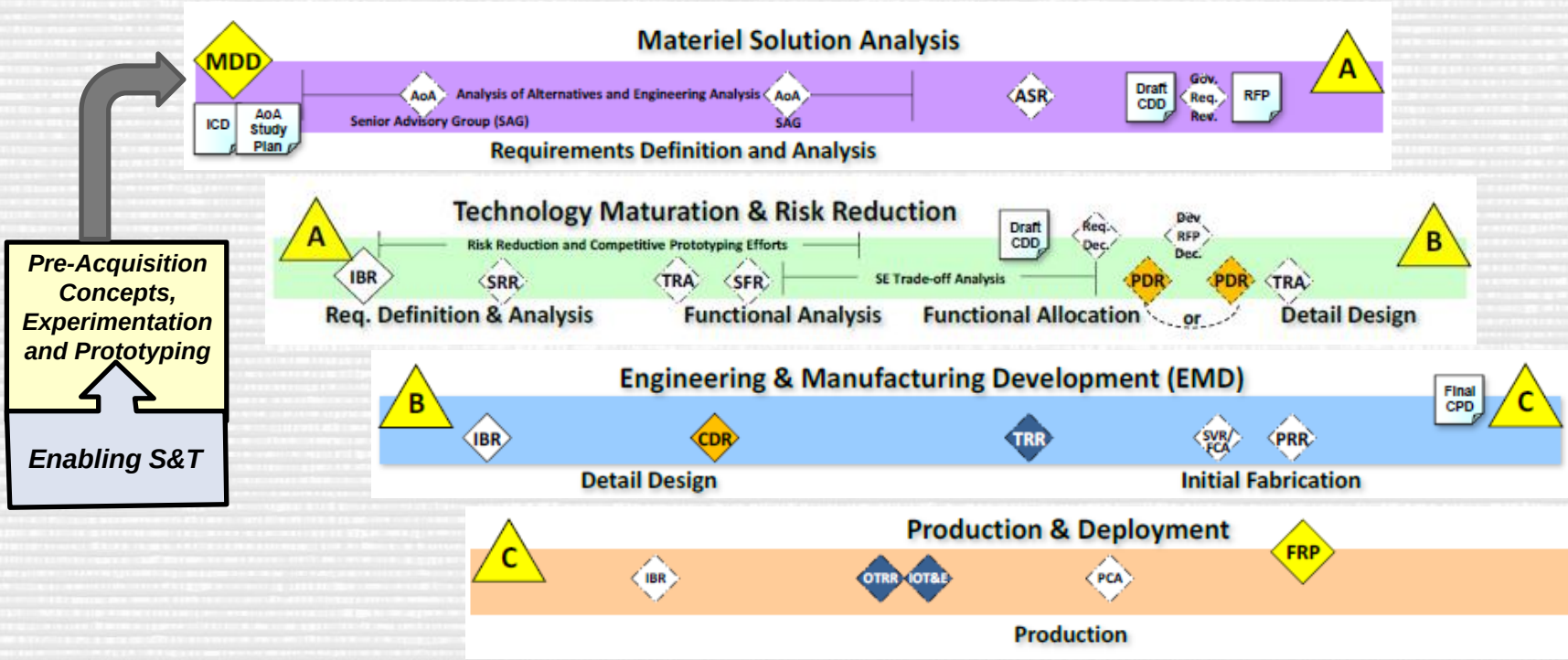
FRAMING ASSUMPTIONS

Framing Assumptions:

- priority or achievability of requirements
- schedule dependencies
- procurement quantities
- threats
- availability of specialty metals or technology
- accuracy of models and simulations

RISK BY ACQUISITION PHASE



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ALIGNING GOVERNMENT AND CONTRACTOR RISK MANAGEMENT

Government PMO, Prime Contractor and associated Subcontractors should employ a consistent Risk Management Process

Establish a Joint Risk Management Database

Risk Management should be integrated with:

- Requirements Development;
- Design, Integration, and Test (Systems Engineering);
- Planning and Management of System Support and Sustainment;
- Schedule Tracking;
- Performance measurement;
- Earned Value Management (EVM) (when implemented);
- Cost Estimating;
- Issue Management; etc…

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DOCUMENTING THE RISK MANAGEMENT APPROACH

Acquisition Strategy addresses Risk at general level.

Government Systems Engineering Plan (SEP) and the contractor Systems Engineering Management Plan (SEMP) should describe:

- The process for how the program plans to manage risks
- How the risk management processes are integrated with the contractor(s) processes
- How the program identifies and analyzes risks
- How the program plans for, implements (including funding), and tracks risk control
- Key roles and responsibilities from working groups, through the IPT structure up to the executive level
- RMB, who chairs, membership, and meeting frequency
- Risk tool(s) that the program office and contractor use to perform risk management

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RISK MANAGEMENT PLAN (RMP) OUTLINE in DoD RIOMG, January 2017

RISK MANAGEMENT PLAN

- **Introduction** – Overview of the purpose and objective of the RMP.
- **Program Summary** – Brief description of the program, including the connection among the Acquisition Strategy, Program Management Plan, and technical strategy.
- **Definitions** – Definitions specific to the program to be used in the plan.
- **Risk Management Strategy** – Overview of the strategy to implement continuous risk management, to include communication between stakeholders and training of the program team in the risk management process and procedures.
- **Risk Management Board(s) and Risk Working Group(s)** – Description of the formation, leadership, membership, and purpose of these groups.
- **Roles, Responsibilities, and Authorities** – Description of roles, responsibilities, and authorities within the risk management process for:
  - o Identifying, adding, modifying, and reporting risks
  - o Providing resources to handle risks
  - o Developing criteria to determine whether a candidate risk is accepted
  - o Changing likelihood and consequence of a risk
  - o Closing/retiring a risk
- **Risk Management Process and Procedures** – Description of the program risk management process, methodology, meeting battle rhythm, and guidance for implementing the plan, according to the tailorable five-step DoD process:
  - o Risk planning
  - o Risk identification
  - o Risk analysis
  - o Risk handling
  - o Risk monitoring
- **Risk Management in Relation to Other Program Management Tools** – List of the risk tools the program (program office and contractor[s]) uses to perform risk management. Preferably, the program office and contractor(s) should use the same tool. If they use different tools, the tools should be capable of seamlessly exchanging data. This section would include a description of how the information would be transferred.
- **Risk Evaluation Techniques** – Summary of the cost, schedule, and performance evaluation processes, including procedures for evaluating risks.
  - o Overview and scope of the evaluation process
  - o Sources of information
  - o Planned frequency of assessments
  - o Products and formats
  - o Evaluation technique and tools
  - o Likelihood and consequence parameters and thresholds
- **Communication and Feedback Process** – Process for communicating and/or elevating the status of potential, current, and retired risks as well as opportunities that may exist to all personnel involved in risk management.

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SELECTING A RISK MANAGEMENT TOOL

Risk management tools support the implementation and execution of risk management.

PM needs to select the appropriate risk management tool(s) early and document details in the SEP.

- Support Objectives: Does the tool aid in meeting program objectives?
- Recurrence: Will the risk management tool accommodate recurring updates to the risk management process?
- Helpfulness: Will the tool be useful during the decision-making process?
- Accessibility: Will the tool be accessible to all users, perhaps remotely, including certain tool-licensing requirements?
- Integration: Does the tool aid in the integration with other program management tools and processes?
- Requirements: Does the tool meet the requirements for the program office and contractor(s)?

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RISK MANAGEMENT BOARD and RISK WORKING GROUP

PM establishes and typically chairs the Risk Management Board (RMB), the approval authority for risk related products

- RMB usually includes PMO functionals e.g. program control, chief engineer, logistics, test, systems engineering, Risk Working Group (RWG) lead, contracting officer, user representative, etc.
- RMB documents actions/decisions in minutes and/or the risk register
- Consider integrated government-contractor RMBs where practical
- Tiered structure is often implemented

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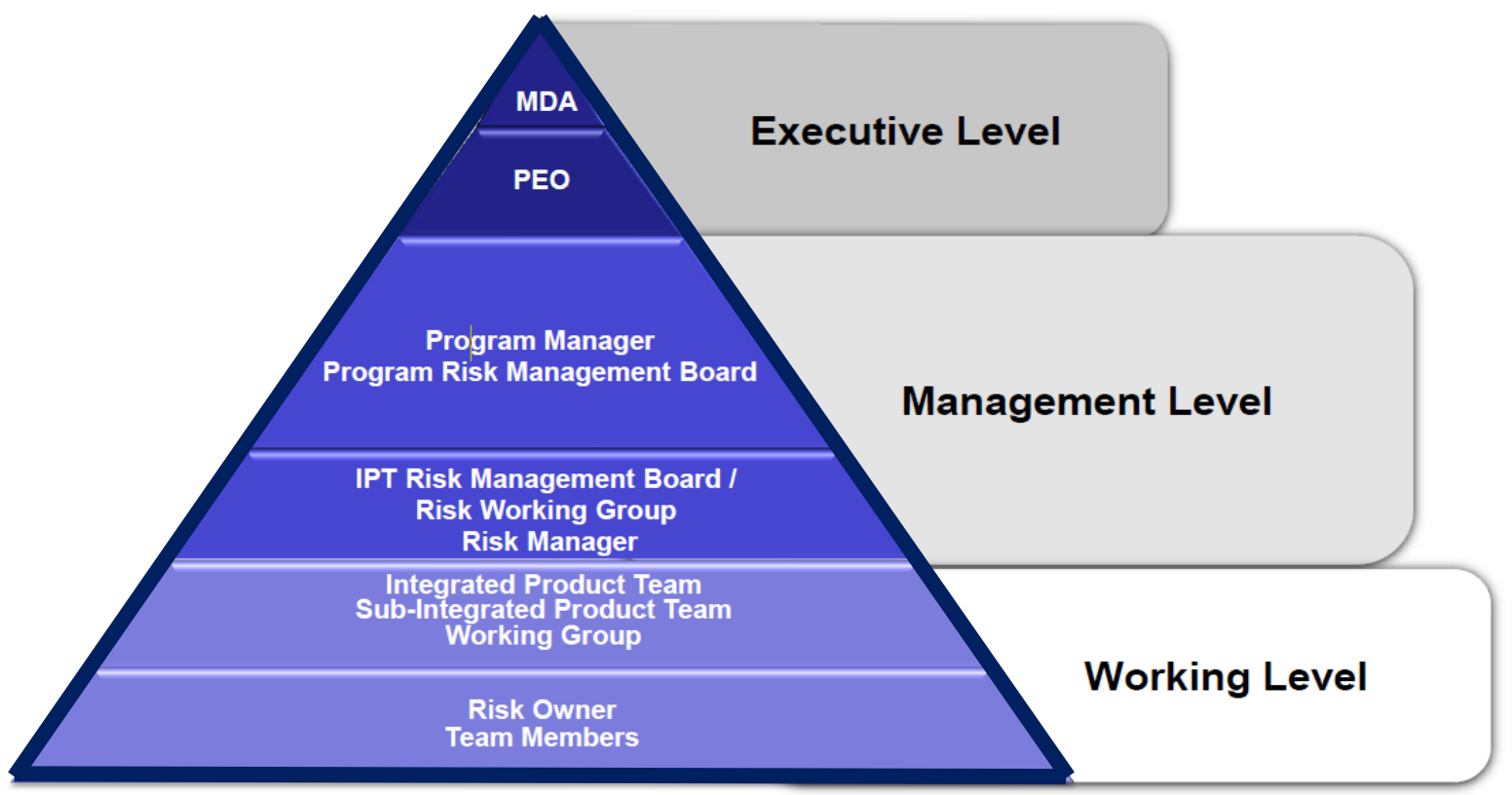
ROLES AND RESPONSIBILITIES



Details of Roles and Responsibilities contained in Appendix of RIOMG

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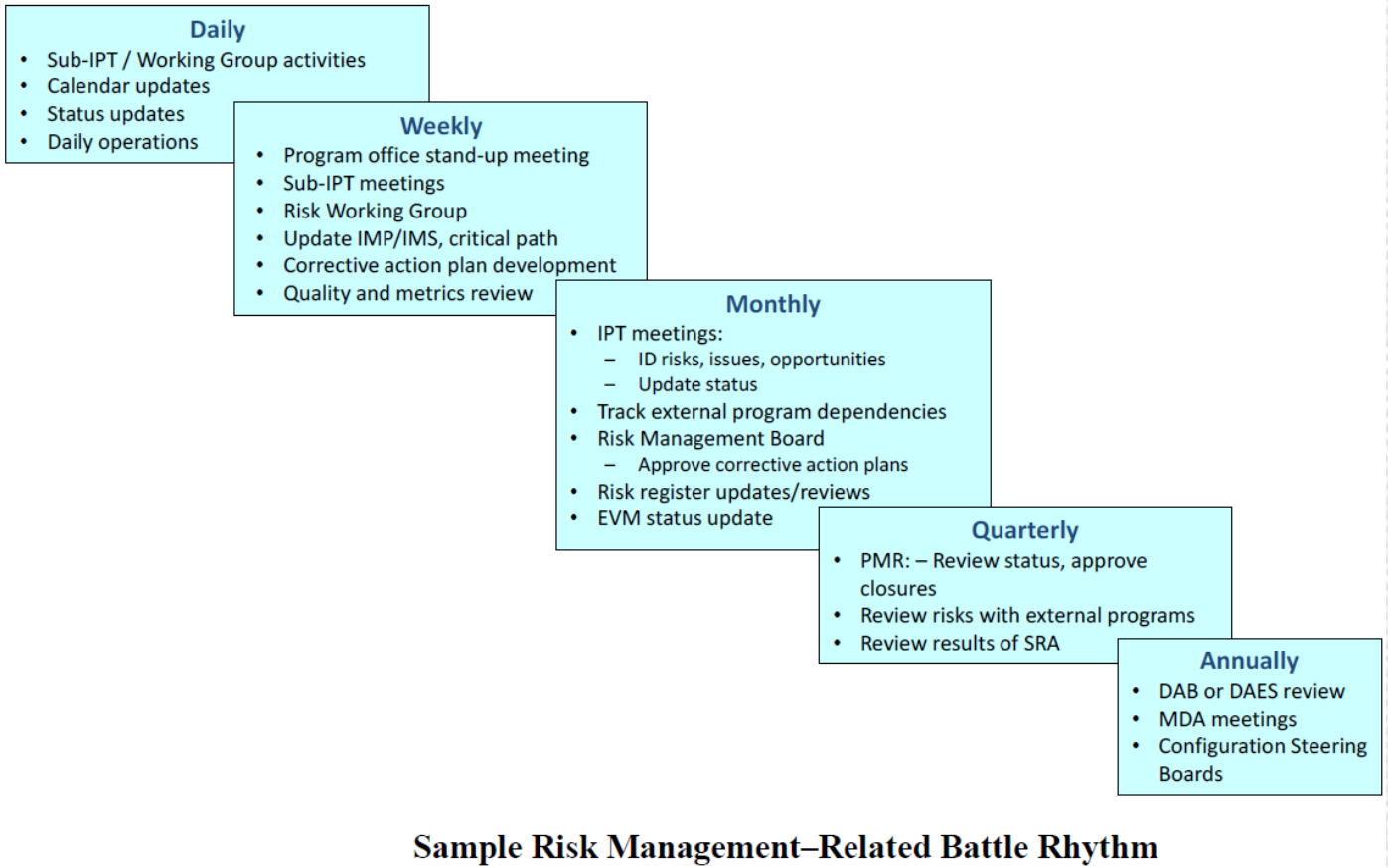
RISK BATTLE RHYTHM



Sample Risk Management–Related Battle Rhythm

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RISK PLANNING SUMMARY

Risk planning consists of the activities to develop, implement, and document the risk management process. Effective planning should outline each of the risk management steps

Risk planning should be summarized in the SEP and the RMP and should address the program's risk management organization (e.g., RMBs, frequency of meetings and members), ground rules and assumptions, candidate risk categories, and use of any risk management tools.

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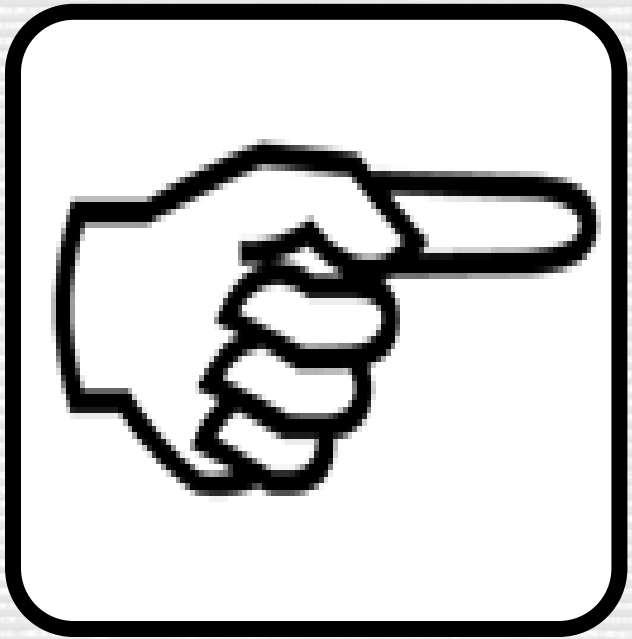
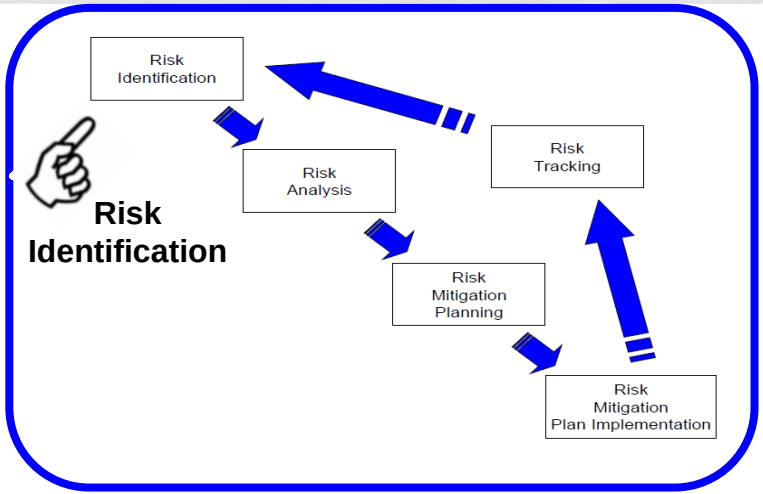
Risk Identification



RISK IDENTIFICATION
IN DOD RMG V6 AND DOD RIOMG MODELS



DoD RMG v6 2005

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IDENTIFYING RISK:
WHAT CAN GO WRONG?

I cannot imagine any conditions which would cause a ship to founder. I cannot conceive of any vital disaster happening to this vessel. Modern shipbuilding has gone beyond that..."

Captain E.J. Smith, 1906, about the Adriatic
(Captain of *Titanic* on the evening on 14 April, 1912)

IDENTIFYING RISK: WHERE TO LOOK FOR POTENTIAL RISKS

Types

- Technical Performance
- Schedule
- Cost

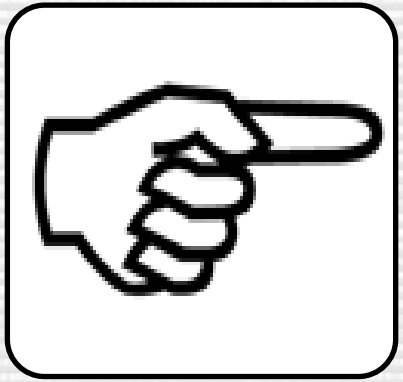
Sources

- Product
- Process
- Scenario

Categories

- Technical
- Programmatic
- Business

RISK?



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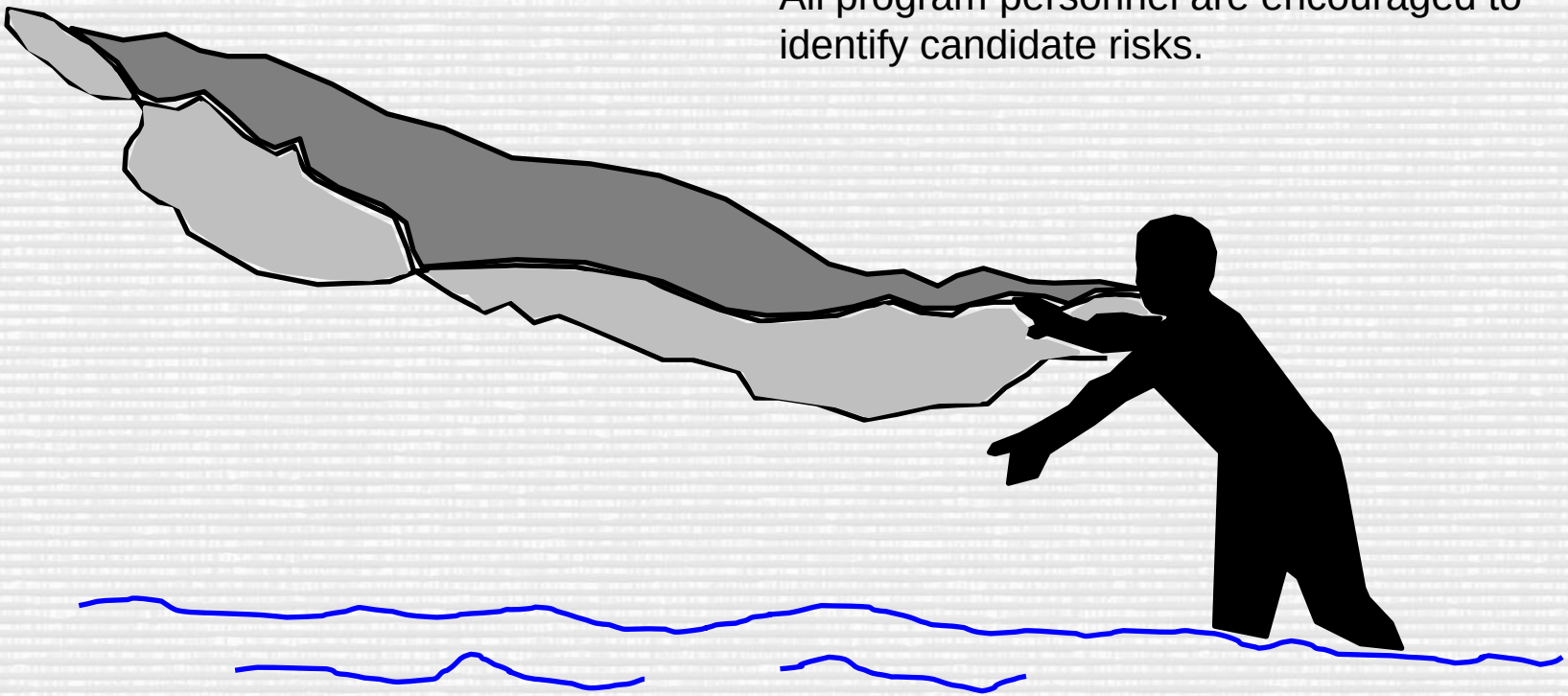
RISK IDENTIFICATION

All program personnel are encouraged to identify candidate risks.



Cast your net wide at first! Do not ignore areas or eliminate ideas early in the process.

TOP-LEVEL RISK ID SOURCES

Where to fish …

- Analysis of Alternatives (AoA)
- Acquisition Strategy
- Systems Engineering Management Plan (SEMP)
- Test and Evaluation Management Plan (TEMP)
- Technology Readiness Assessment (TRA)
- Program Protection Plan (PPP)
- Life-Cycle Sustainment Plan (LCSP)
- Life-Cycle Mission Data Plan (LMDP)

- Acquisition Program Baseline (APB)
- Systems Engineering Plan (SEP)
- Integrated Master Plan (IMP)
- Integrated Master Schedule (IMS)
- Contract structure and provisions
- Government technical requirements and specifications documents
- Joint Capabilities Integration and Development System (JCIDS) documents

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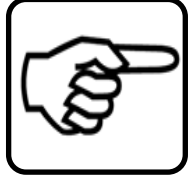
LOWER-LEVEL RISK ID SOURCES

- SME brainstorming activities
- Interviews with program team leads, SMEs, and/or program stakeholders
- Review of lessons learned, including risks or issues on predecessor or similar programs
- Examination of new contract activity and proposals, e.g., the IBR
- Tech Reviews
- Requirements Analysis
- Immature Technologies
- Design Shortfalls
- Trade Studies
- ID of cost/schedule/performance drivers
- Checklists
- Trigger Questions on Key Processes
- Evaluation of results from competitive and risk reduction prototyping
- Evaluation of results from integration and test activities
- Design changes

Where to fish …

- Leading indicators
- FMEA and other Reliability Analysis
- Specialty engineering e.g. manning, HSI, supportability/sustainment …
- PPP and Cybersecurity
- Independent Assessments
- Trends in progress toward meeting KPPs, KSAs, TPMs, schedules, budgets, EVM, and other metrics
- External influences:
  - Changes in user requirements, threats, CONOPs, and requirements creep
  - Funding levels
  - Other stakeholder requirements
  - Synchronization with critical external programs
  - Statutory / Service or DoD policy changes
- Production Considerations



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WHEN IDENTIFYING RISKS

When identifying risks:

- Understand the nature of the product and the requirements that shape the product
- Use various risk ID methodologies:
  - Independent assessments
  - SOW requirements
  - Brainstorming sessions with SMEs
  - Interviews with IPT leads, Systems Command/Center competencies
  - Review of similar/historical programs
  - Trade studies
- Review analysis of Technical Performance Measures, resource data, life cycle cost information, WBS/IMS/EVM data trends, and progress against critical path
- Assess technical performance at all levels: component, subsystem, integrated product, external interfaces. How big a gap? How challenging to cross it?

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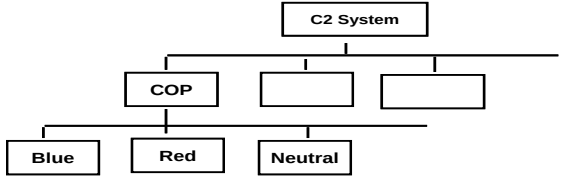
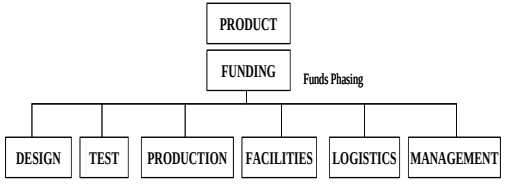
3 MORE WAYS FOR RISK ID

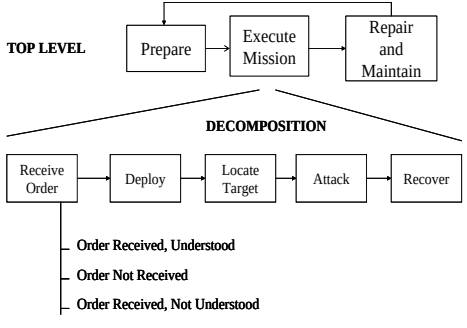
1. Product based evaluation
   - Uses Work Breakdown Structure
   - Looks at system architecture
   - Identifies program relationships



2. Process based evaluation
   - Focuses on processes used to define, develop and test a system
   - Looks at internal organizational processes



3. Scenario based evaluation
   - Risks from a customer and supplier point of view
   - Requires knowledge of customers and suppliers, or their inputs/time



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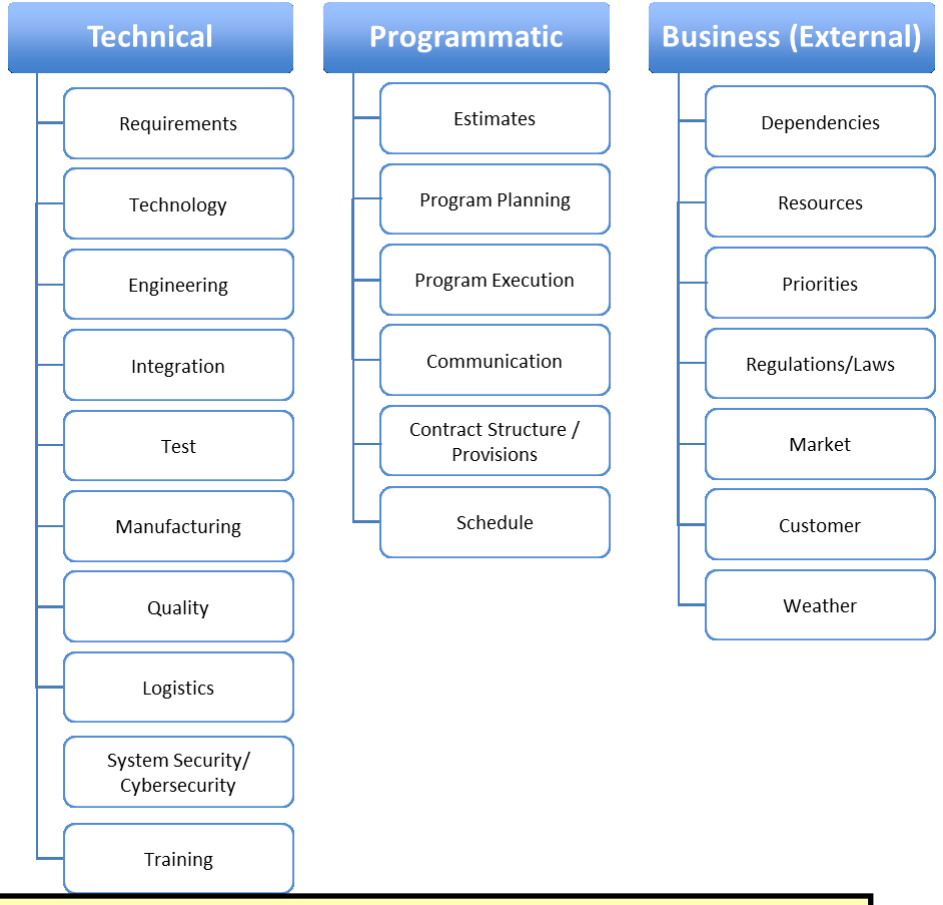
RISK CATEGORIES

RISKS can be broadly grouped into three categories:



DoD Risk, Issue, and Opportunity Management Guide January 2017

MORE IDENTIFYING RISK IDEAS:
TECHNICAL RISK DRIVERS

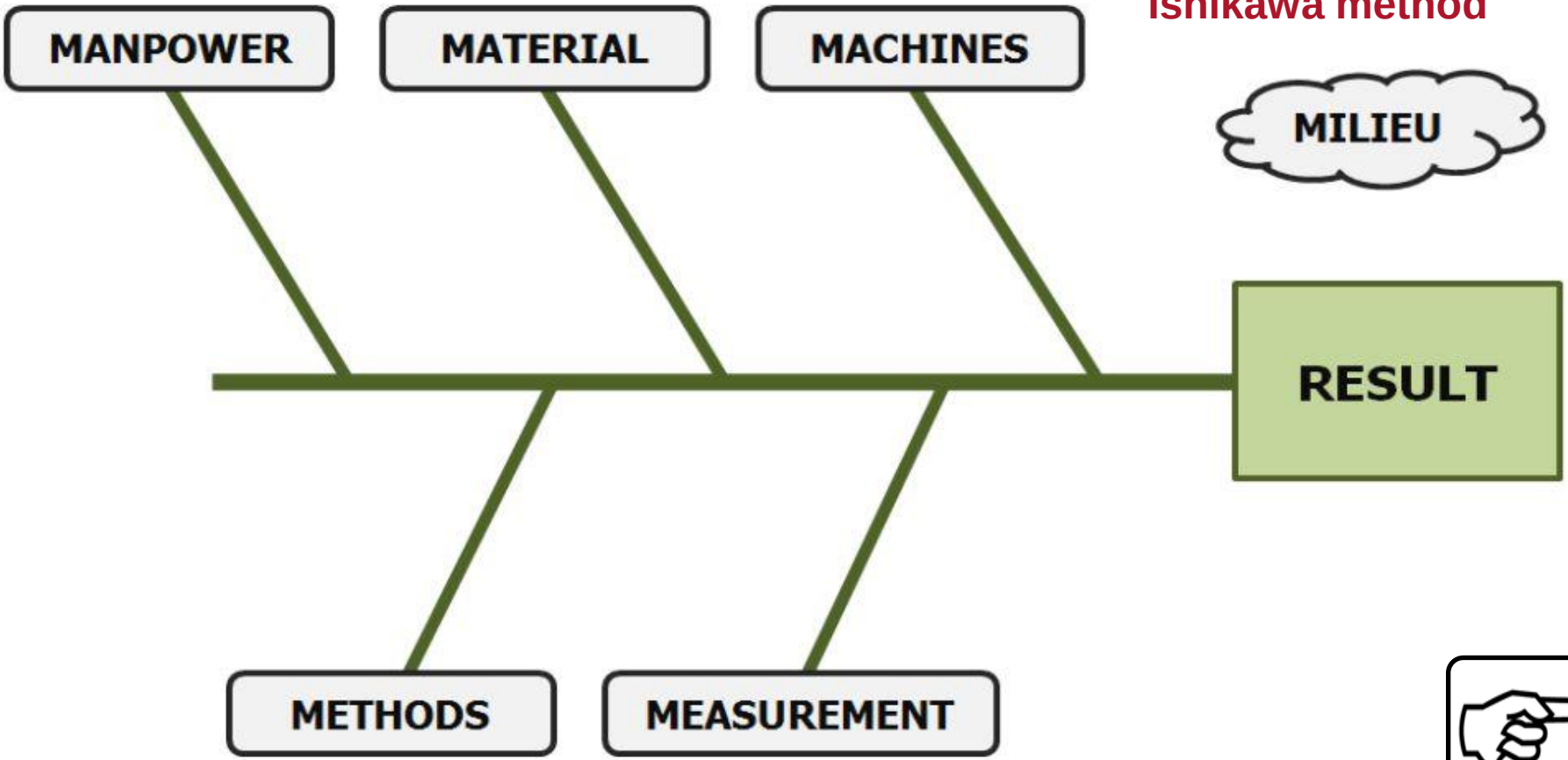
- Requirements
- Proprietary Data/Designs
- Technology
- Hardware State-of-the-art
- Support Concepts
- Reliability and Maintenance
- Constraints
- Personnel
- Computer Resources
- Manufacturing Resources
- New Manufacturing/labs
- Standards
- Government Furnished Equipment/Personnel
- Environment
- Tools
- Data Rights
- Experience
- Documentation
- Management Approach

Software Specific Risks

- Complexity
- Size
- Stability
- Developmental Approach
- Process Model
- Process Maturity
- Integration Approach

IDENTIFYING RISK USING THE 6 *M*'S

Ishikawa method



EXERCISE: RISK DRIVERS

RISK STATEMENTS

The risk description should be a single declarative statement generally following the format below:

Two examples:

Risk #1: If the V1.3 software is not able to provide properly formatted mission data to Program A, **then** Program A may not meet a Key Performance Parameter.

Risk #2: If there is a delay in receiving software updates, **then** Program A's production timeline may not be met.

RISK IDENTIFICATION EXAMPLE

If

Some negative event occurs

Stuck in Traffic Jam

Then

Something bad may result

Late for important event

RISK IDENTIFICATION EXAMPLE

If

Some negative event occurs

Fail Exam

Then

Something bad may result

may Not Graduate

RISK IDENTIFICATION EXAMPLE

If

Some negative event occurs


STAGE

BROADWAY

SCREEN

VARIETY

25¢

VOL. XCVII. No. 3 NEW YORK, WEDNESDAY, OCTOBER 30, 1929 80 PAGES

WALL ST. LAYS AN EGG

Going Dumb Is Deadly to Hostess In Her Serious Dance Hall Profesh

DROP IN STOCKS RUPES SHOWMEN

Kidding Kissers in Talkers Burns Up Fans of Screen's Best Lovers

Hunk on Winchell

Talker Crashes Olympus

MERGERS HALTED

Stock Market Crashes

Then

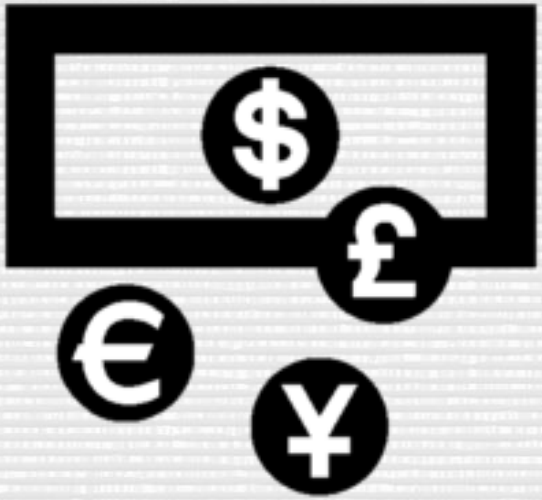
Something bad may result

may Not Be Able to Retire

RISK IDENTIFICATION EXAMPLE

If

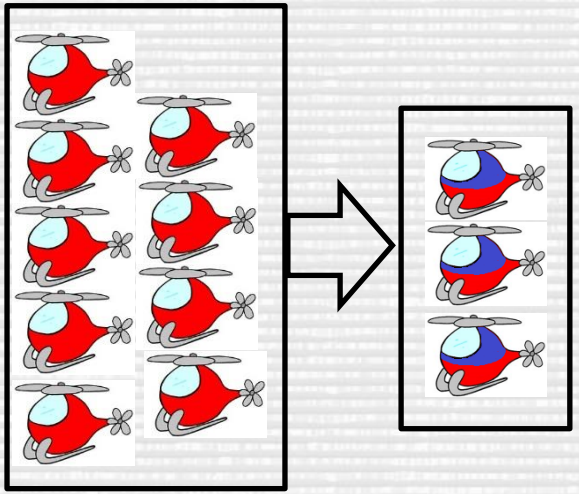
Some negative event occurs



Exchange Rate Changes

Then

Something bad may result



FMS Customer Buys Less

RISK IDENTIFICATION EXAMPLE

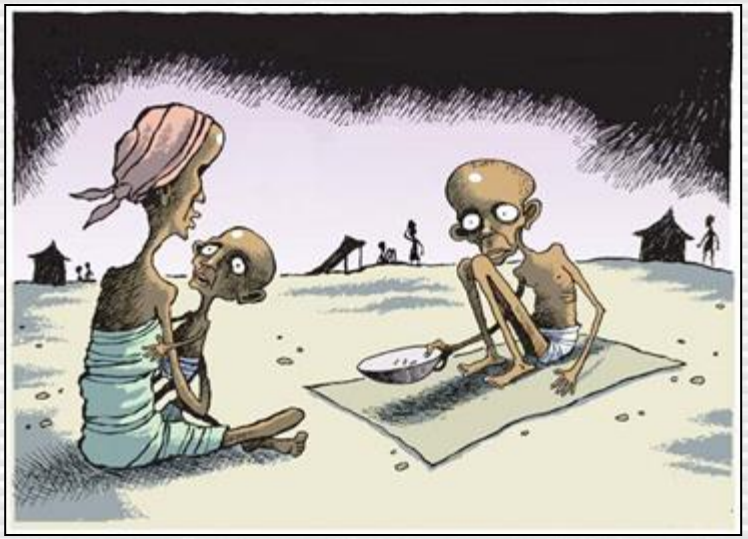
If

Some negative event occurs

Crops Fail

Then

Something bad may result



Starve

IF – THEN IS NOT ENOUGH

Good “If – Then” Statements are Critical to effective Risk Management but they are not enough …

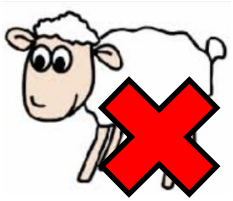
okay… but so what? Must know WHY in order to do something about it (Handling).

ROOT CAUSE DETERMINATION

If

Crops Fail

WHY?



Why? → Gods are Angry

Why? → Sacrifice Not Accepted

Why? → Not What Is Required

Why? → Not Heart of Warrior

Why? → No Captured Warriors

Ask "Why" multiple times until the root cause(s) is (are) discovered

RISK ID AND ROOT CAUSE

Untold numbers sacrificed over at least 1000 years throughout much of Mesoamerica

… but did they correctly identify the risk?

RISK IDENTIFICATION METHOD

Another way to phrase risk statements:

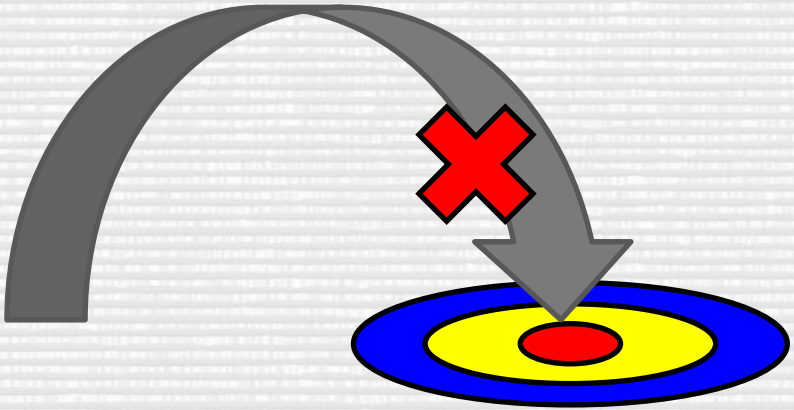
We (the project) might not …
(deliver some promise)
(meet some expectation)

Because …
(some reason)

RISK IDENTIFICATION EXAMPLE

We might not

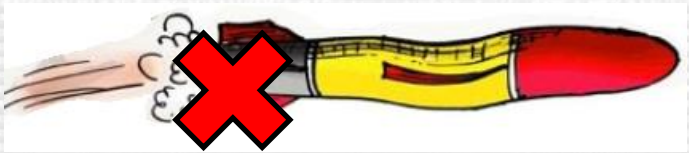
Some promise



Meet Required Mission Range

Because

Some reason



Engine Died

RISK IDENTIFICATION EXAMPLE

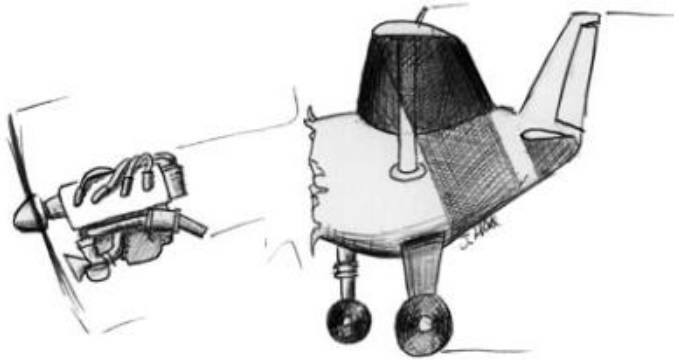
We might not

Some promise

Meet Delivery Schedule

Because

Some reason



Acceptance Test Failure

RISK IDENTIFICATION EXAMPLE

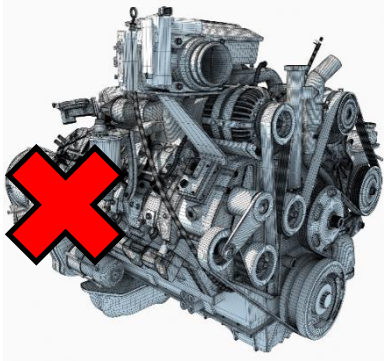
We might not

Some promise

Meet Availability Requirements

Because

Some reason



Engine Does Not Start

RISK IDENTIFICATION

MUST DRILL DOWN

The project might not:

(deliver some promise)

(meet some expectation)

Because:

(some reason)

(some reason)

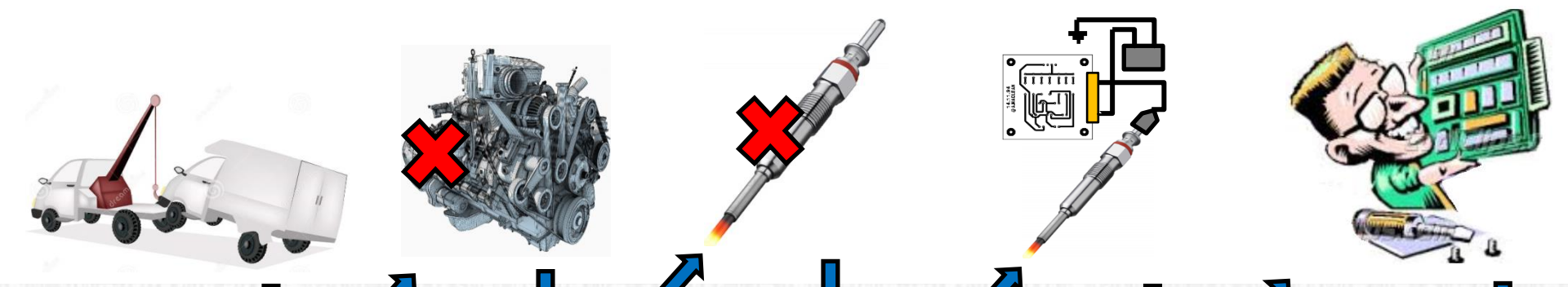
(some reason)

(some reason)

(some <u>fundamental</u> reason)

ROOT CAUSE DETERMINATION

We Might Not: Because:



Why? Meet Availability Requirements

Why? Engine Does Not Start

Why? Glow Plug Failure

Why? Glow Plug Remains On After Start

Why? Counterfeit Circuit Boards

Ask "Why" multiple times until the root cause(s) is (are) discovered

ROOT RISK EVENT

If

Some negative event occurs

Then

Something bad may result

Purchase Counterfeit Circuit Boards

"Root Risk Event"

Series of Events

Fail to Meet Availability Requirements

"Consequence"

RISK IDENTIFICATION METHOD

Yet another way to phrase risk statements:

There is a probability that…

some (risk event AKA root cause) may occur…

Resulting in… (some negative outcome)

may also add:

Because… (some reason)

EXERCISE: RISK STATEMENTS

Formats:

a) IF (some event) THEN (some consequence)

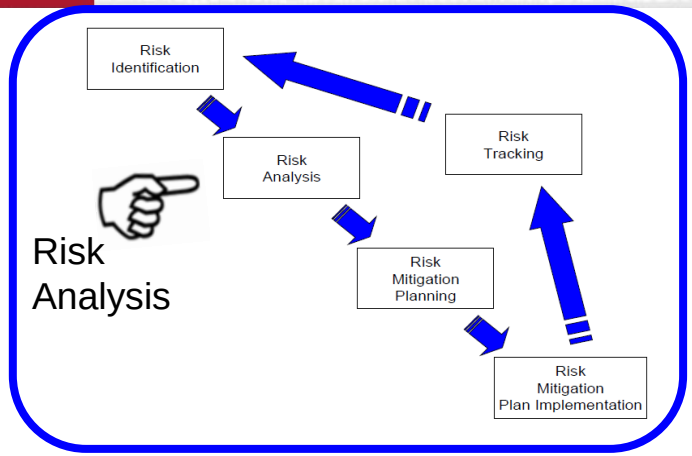
b) WE MIGHT NOT (some promise) BECAUSE (some reason)

c) THERE IS A PROBABILITY THAT (some risk event) MAY OCCUR, RESULTING IN (some negative outcome),

(optional) BECAUSE (some reason)

Risk Analysis

RISK ANALYSIS



DoD RMG v6 2005

DoD Risk, Issue, and Opportunity Management Guide January 2017

ANALYZING RISK:
WHAT DO RISKS MEAN?

Estimate Likelihood/Consequence

- Technical Performance
- Schedule
- Cost

Determine the Risk Level

- Use consistent predefined likelihood and consequence criteria

Government and Contractor should use common framework

Use Quantitative Data when possible

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RISK ANALYSIS

Risk analysis answers the questions:

What are the likelihood and consequence of the risk?

and *How high is the risk?*

During risk analysis, the program will:

- Estimate the likelihood the risk event will occur.
- Estimate the possible consequences in terms of cost, schedule, and performance.
- Determine the resulting risk level and prioritize for mitigation.

Analysis provides an estimate of each risk and resulting risk level to more effectively manage risks and prioritize mitigation efforts.

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ANALYZING RISK:

When analyzing risks:

- Quantify the cost, schedule, and performance impacts:
  - RDT&E costs
  - Procurement costs
  - O&S costs
  - Performance thresholds
  - Schedule thresholds
  - Affordability caps
- Assess the likelihood of the risk being realized
- Conduct analysis periodically to support cost, schedule, and performance risk assessments

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RISK ANALYSIS CRITERIA

- When analyzing risks, each risk should be evaluated in terms of impact to the program (i.e., effect of the event on program cost, schedule, and performance) should the risk be fully realized.
- Risk consequence is measured as a deviation against program cost, schedule, and performance baselines.
- While the government and contractor will at times have different perspectives on risks and priorities, they should seek to have a common framework for risk consequence and likelihood criteria.

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CONSEQUENCE CRITERIA

Levels and Types of Consequence Criteria

Level	Technical Performance	Schedule	Cost
1	Minimal or no consequence to technical performance	Minimal or no impact	Minimal or no impact
2	Minor reduction in technical performance or supportability, can be tolerated with little or no impact on program	Able to meet key dates. **Slip < * month(s)**	Budget increase or unit production cost increases. **< ** (1% of Budget)**
3	Moderate reduction in technical performance or supportability with limited impact on program objectives	Minor schedule slip. Able to meet key milestones with no schedule float. **Slip < * month(s)** **Sub-system slip > * month(s) plus available float.**	Budget increase or unit production cost increase **< ** (5% of Budget)**
4	Significant degradation in technical performance or major shortfall in supportability; may jeopardize program success	Program critical path affected. **Slip < * months**	Budget increase or unit production cost increase **< ** (10% of Budget)**
5	Severe degradation in technical performance; Cannot meet KPP or key technical/supportability threshold; will jeopardize program success	Cannot meet key program milestones. **Slip > * months**	Exceeds APB threshold **> ** (10% of Budget)**

Tailored to program

DoD Risk Management Guide 6th Edition, Aug 2005

CONSEQUENCE CRITERIA

Level	Cost*			Schedule	Performance
	RDT&E	Procurement	Operations & Maintenance/Sustainment		
5	Major impact. 10% or greater increase over APB threshold; or >$D. Management reserve depleted.	Major impact. Budget or unit production cost (e.g., APUC) increasing to a significant Nunn-McCurdy breach; or increase of more than $XX in programmed dollars (POM)	Costs exceed life cycle ownership cost by 10%.. Ability to sustain system in jeopardy.	Schedule slip that requires a major schedule re-baselining; precludes program from meeting its APB schedule objectives by more than 6 months; negative float to program completion	Severe degradation precludes system from meeting a KPP or key technical/supportability threshold; will jeopardize program success; design or supportability margins exceeded; unable to meet mission objectives (defined in mission threads, ConOps, OMS/MP)
4	Significant impact. 5% -<10% increase over APB threshold; or $C-≤$D. Requires use of significant management reserves.	Significant impact. Costs that drive a unit production cost (e.g., APUC) increasing to an APB threshold breach of $C - ≤ $D; or increase of $YY-XX in programmed dollars (POM)	Costs drive increase of more than z% over program's lifecycle cost estimate; costs drive program to exceed life cycle ownership cost KSA.	Significantly impacts ability to meet planned milestones and/or other key dates. Established acquisition decision points or milestones will be delayed, impacting APB schedule objectives by less than 6 months. Slip puts funding at risk; <5% float to major milestones or program completion	Significant degradation impairs ability to meet a KSA; Technical design or supportability margin exhausted in key areas; able to meet one or more mission tasks . (defined in mission threads, ConOps, OMS/MP); workarounds required to meet mission objectives
3	Moderate impact. 3% -<5% increase over APB threshold; or $B - ≤ $C; manageable with reserves; inability to meet key cost metrics	Moderate impact. Costs that drive unit production cost (e.g., APUC) increase of $B -≤ $C; or $ZZ-YY in programmed dollars (POM); inability to meet key cost metrics	Costs drive increase of y - z% over program's lifecycle cost estimate or within 2% of life cycle ownership cost KSA; inability to meet key cost metrics	Minor schedule slip, able to meet key milestones. Total program float decreased by X-Y% with float remaining positive, but nearly consumed; <10% float to major milestones or program completion; inability to meet key schedule metrics	Moderate reduction in technical performance or supportability, unable to meet lower tier attributes (e.g. PAs); planned design or supportability margins reduced; inability to meet key TPMs, CTPs; . Workarounds required to achieve mission tasks (defined in mission threads, ConOps, OMS/MP)
2	Minor impact. 1% - <3% increase over APB threshold; or $A- ≤ $B; exceeding cost metrics tripwires	Minor impact. Costs that drive unit production cost (e.g., APUC) increase of $A-≤ $B; or $AA-ZZ in programmed dollars (POM); exceeding cost metrics tripwires	Costs drive increase of x- y% over program's lifecycle cost estimate; exceeding cost metrics tripwires	Able to meet key dates. Total program float decreased by less than X%, with 10% or greater positive float remaining.; exceeding schedule metrics tripwires	Minor reduction in technical performance or supportability; can be tolerated with little or no impact on program objectives. Design margins will be reduced, but within limits / tradespace; exceeding key TPMs, CTPs tripwires
1	Minimal impact. <1% increase over APB threshold; or <$A. Costs expected to meet approved funding levels, not projected to increase above thresholds	Minimal impact. Costs that drive APUC increase of ≤ $A ; or less than $AA in programmed dollars (POM). Costs expected to meet approved funding levels, not projected to increase above thresholds	Costs drive increase of ≤$x% over program's lifecycle cost estimate.	Minimal or no schedule impact.	Minimal or no consequences to meeting technical performance or supportability requirements. Design margins will be met; margin to planned tripwires.

Tailored to program - Programs can break out cost or consolidate

DoD Risk, Issue, and Opportunity Management Guide June 2015

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; margin to planned tripwires

Tailored to program - Programs can break out cost or consolidate

DoD Risk, Issue, and Opportunity Management Guide January 2017

LIKELIHOOD CRITERIA

Levels and Types of Likelihood Criteria

Level	Likelihood	Probability of Occurrence
1	Not Likely	~10%
2	Low Likelihood	~30%
3	Likely	~50%
4	Highly Likely	~70%
5	Near Certainty	~90%

Tailored to program

DoD Risk Management Guide 6th Edition, Aug 2005

LIKELIHOOD CRITERIA

Table 3-2. Recommended Likelihood Criteria

Level	Likelihood	Probability of Occurrence
5	Near Certainty	> 80% to ≤ 99%
4	Highly Likely	> 60% to ≤ 80%
3	Likely	> 40% to ≤ 60%
2	Low Likelihood	> 20% to ≤ 40%
1	Not Likely	> 1% to ≤ 20%

Specific Criteria Recommended

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RISK ANALYSIS

Risks can be characterized as

HIGH, **MODERATE**, or **LOW**

based on predetermined rating thresholds.

Risk Level is calculated for each risk and serves as the means to rank the program risk.

This difficult but important step in the risk management process helps the program determine resource allocation and the appropriate mitigation strategy.

RISK ANALYSIS

How big is the Risk? and

What are the Likelihood and Consequence should it occur?

Assess Consequence

Analyze the possible consequences in terms of technical, schedule, cost (RDT&E, Procurement and O&M)

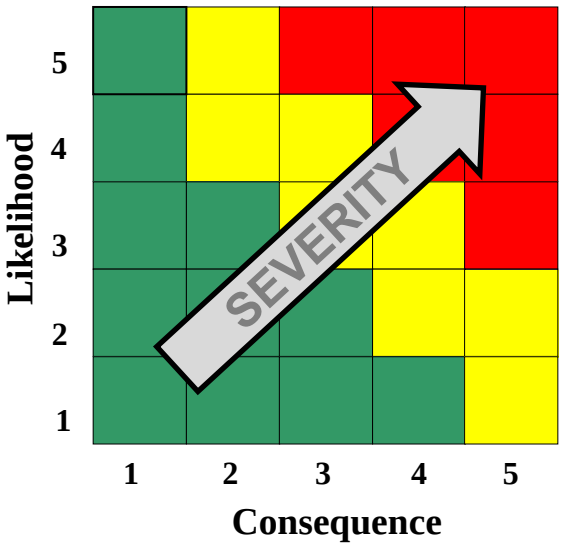
Assess Likelihood of occurrence

Identify the risk level in the 5X5 risk reporting matrix

Risk Reporting Matrix is the same in both DoD RMG v6.0 and DoD ROIMG

Risk Reporting Matrix

(DoD Risk Management Guide)



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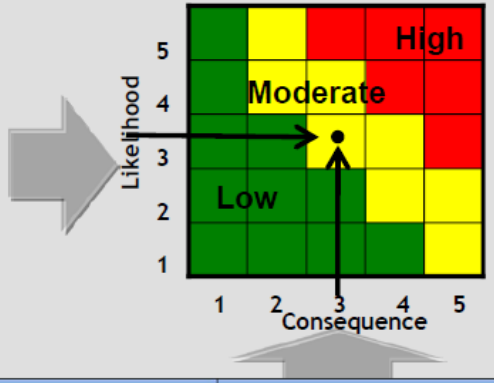
DOD RISK REPORTING MATRIX

Level	Likelihood	Probability of Occurrence
5	Near Certainty	> 80% to ≤ 99%
4	Highly Likely	> 60% to ≤ 80%
3	Likely	> 40% to ≤ 60%
2	Low Likelihood	> 20% to ≤ 40%
1	Not Likely	> 1% to ≤ 20%



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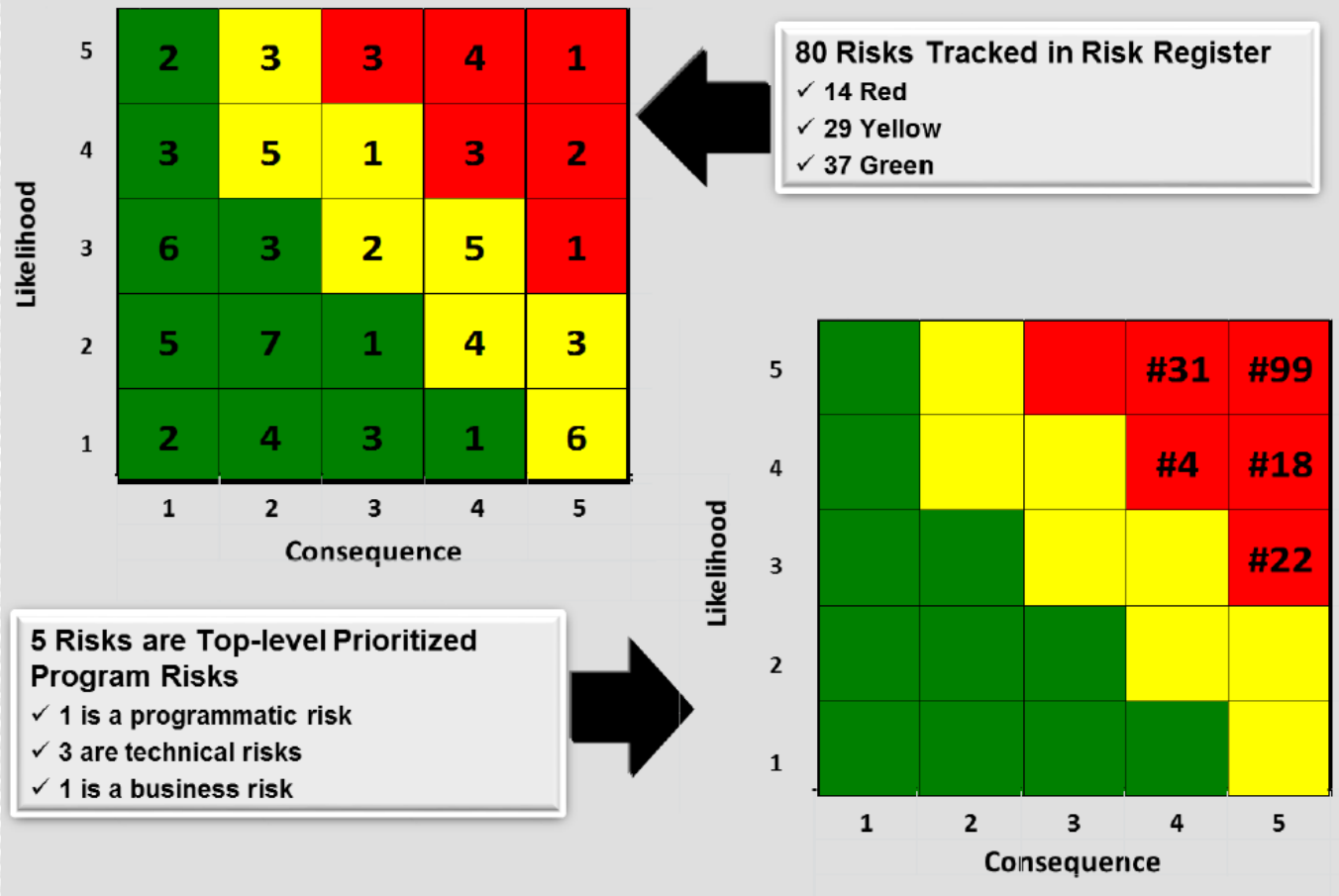
DOD RISK REPORTING MATRIX



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EXPECTED MONETARY VALUE

Risk	Likelihood	Consequence Cost	Exposure	Cost to Handle	Return on Investment
Risk 1:	20%	$10M	$2M	$1M	$1M
Risk 2:	70%	$10M	$7M	$1M	$6M
Risk 3:	40%	$36M	$9M	$2M	$7M
Risk 4:	60%	$5M	$3M	$.5M	$2.5M
Total		**$61M**	**$21M**	**$4.5M**	

Programs should compare cost burdened risk and cost of handling strategies.

Cost exposure of a risk can be expressed as its EMV, which is the likelihood of the risk multiplied by the cost consequence of the risk if realized.

Cost of the risk handling effort is then subtracted from the risk exposure to determine the “likely” return on investment (ROI).

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RISK ANALYSIS EXPECTATIONS

➢ ***Expectations:***

- Risk statements and descriptions fully document events that could adversely affect a program's ability to meet cost, schedule, and performance objectives or baselines.
- Risk statements are clearly written using an "if–then" or similar construct.
- Programs use established criteria, tailored only as necessary, to provide a consistent means for evaluating risks.
- Resulting likelihood and consequence ratings should be supported by data and analysis.
- Programs conduct periodic risk analyses to update risk estimates and to align and support other program activities such as EVM, IMS, and technical reviews.
- If the analyzed likelihood is 100 percent, the program should address the event or condition as an issue rather than a risk.

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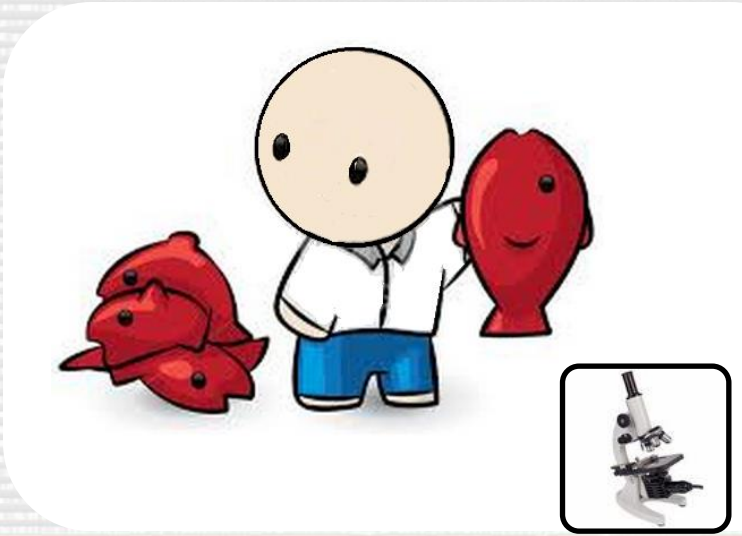
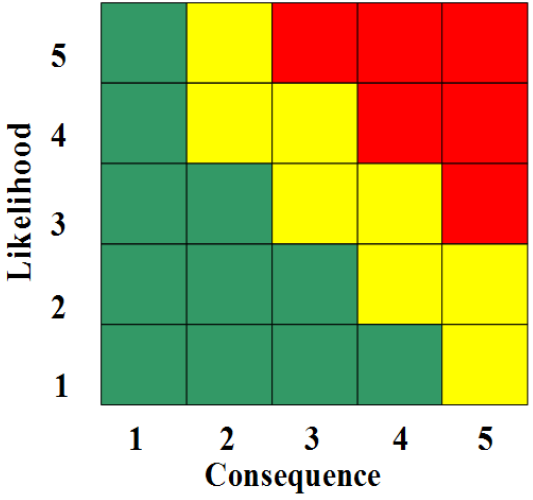
EXERCISE: RISK ANALYSIS

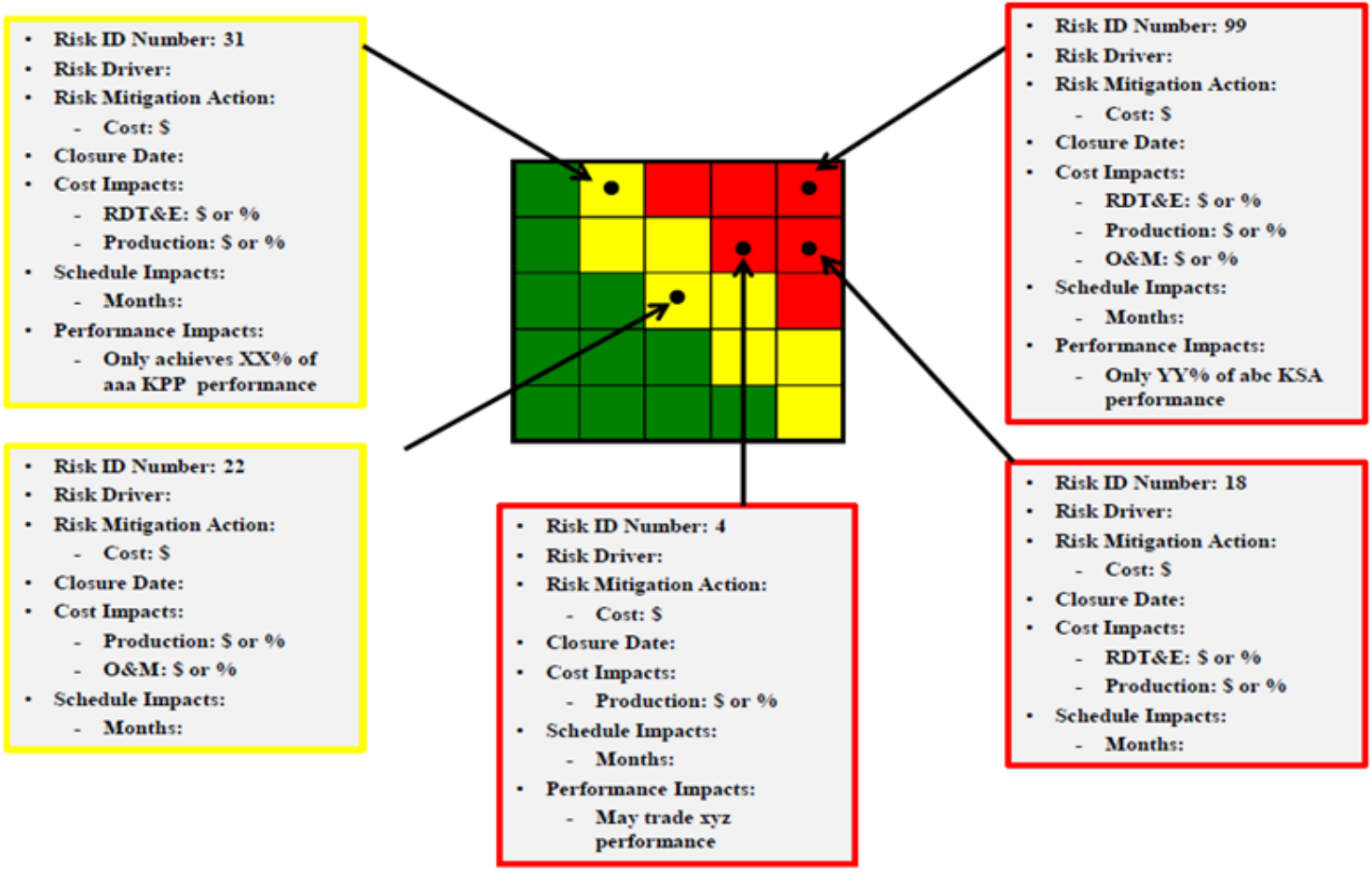


RISK MATRIX TEMPLATE

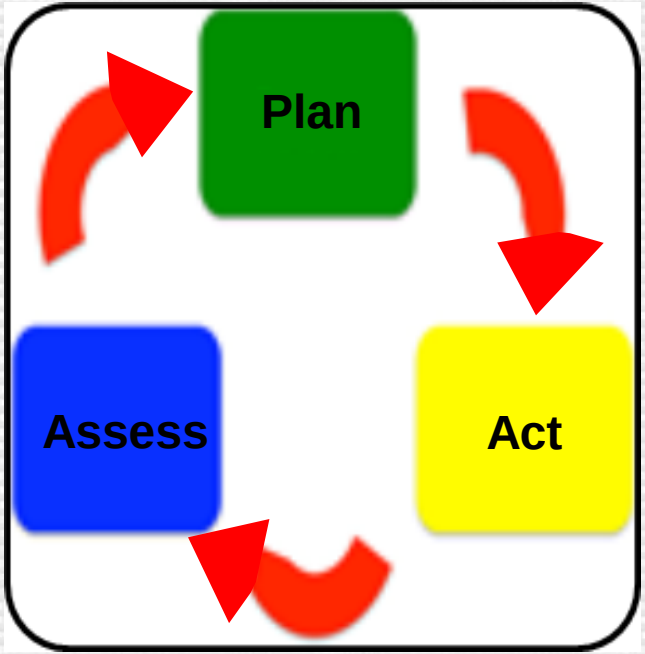


Populate Risk Matrix with Top Five Risks

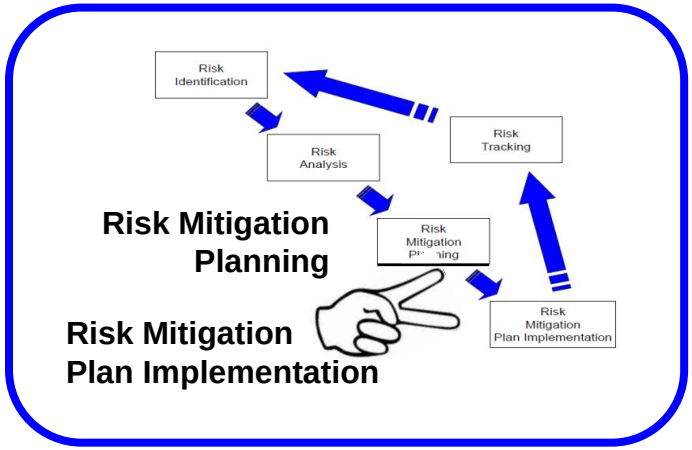
RISK MATRIX EXAMPLE



Risk Mitigation



RISK MITIGATION



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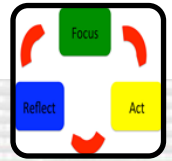

RISK MITIGATION

When mitigating individual risks:

- Consider the accept, avoid, and transfer options, not just the control option
- Choose the best mitigation options, then select the best implementation approach for those options
- Ensure appropriate peers and stakeholders are informed about high-risk items; elevate as needed
- Include cross-program risks in order to consider the impact of risk mitigation actions on other programs

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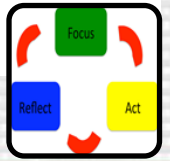

RISK MITIGATION APPROACH

When selecting the mitigation option(s) and formulating the implementation approach, the risk owner and RMB should address questions such as:

- Is the risk mitigation plan **feasible** (options and implementation approach)?
- Is the risk mitigation plan **affordable** in terms of funding and any needed additional resources (e.g., personnel, equipment, facilities)?
- Is adequate **time** available to develop and implement the risk mitigation plan?
- What **impact** does the risk mitigation plan have on the overall program schedule and on the technical performance of the system?
- Are the **expectations** realistic given program circumstances, constraints, and objectives?

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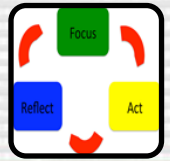


FOUR FUNDAMENTAL STRATEGIES

Avoid

Eliminate the risk event or condition

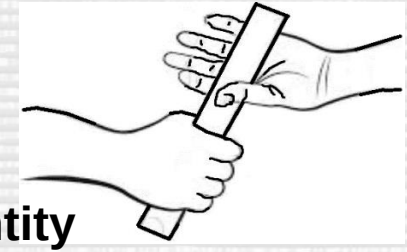
Control

Actively reduce risk to an acceptable level

Assume (Accept)

Accept the level of risk, but continuing on the current program plan

Transfer



Transfer to another entity

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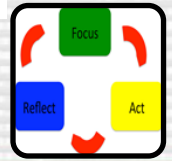
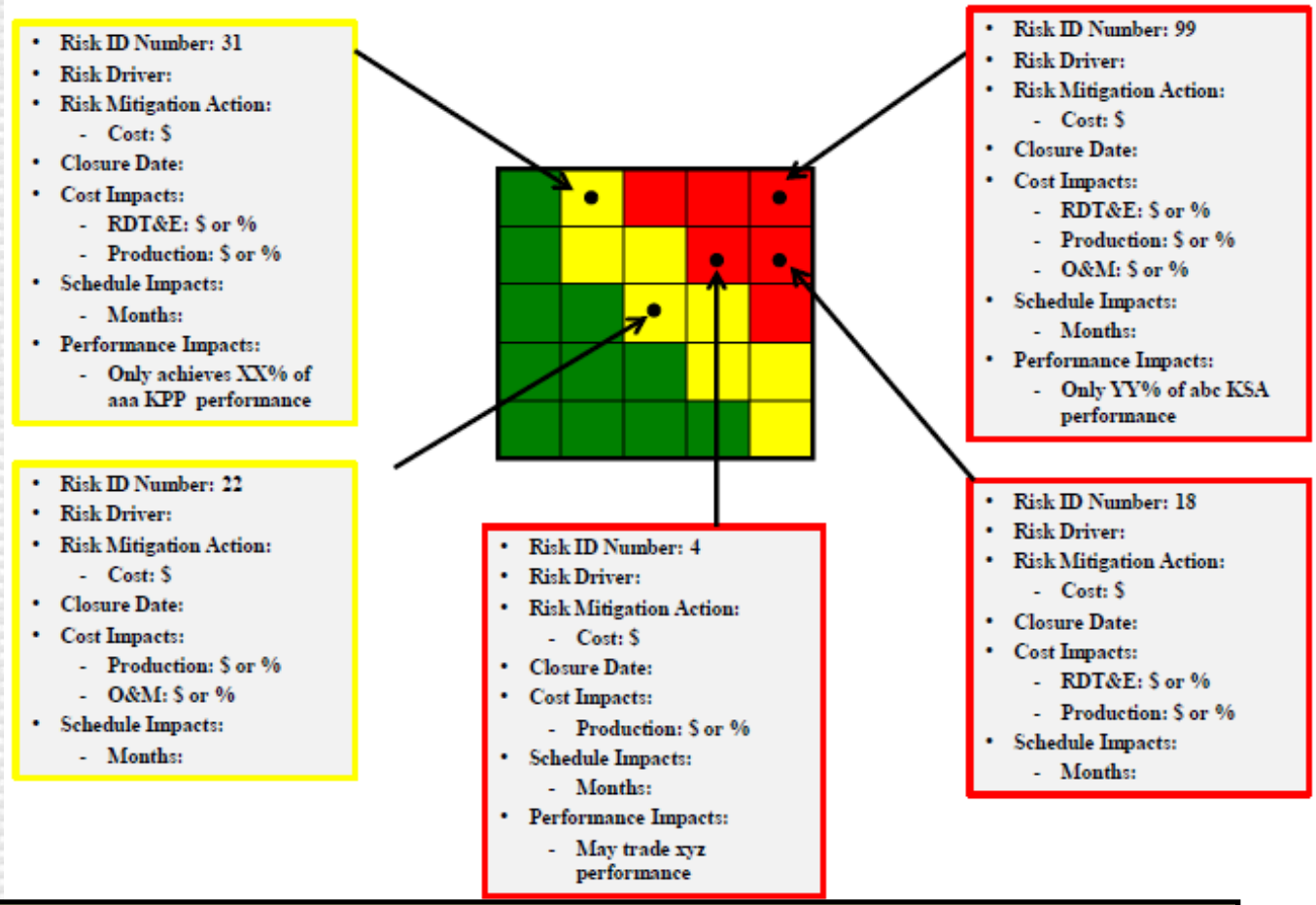


RISK REPORTING MATRIX



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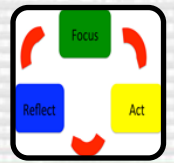
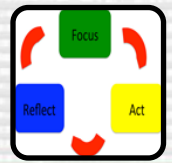


RISK REGISTER

Risk Number	Linked WBS/IMS ID#	Owner	Type of Risk	Status	Tier	Risk Event	Likelihood, Consequence Rating	Risk Handling Strategy	Risk Identified Date	Risk Approval Date	Planned Closure Date	Target Risk Rating	Plan Status
8231	3.2.2	Name	Technical	Open	II	Excessive number of priority 1 and 2 software defects may cause a delay to the start of IOT&E	L=3, C=4	Mitigation - Program will apply management reserve to retain adequate software engineers to burn-down SW defects	8/23/2013	1/14/2014	2/12/2014	L=1, C=4	On schedule



RMB ACTIONS

Risk Management Board (RMB) should compile a list of criteria that answers questions such as:

- Is the approach feasible in implementation?
- Are the expectations realistic in effectively reducing program risk to an acceptable level?
- Is the approach affordable in terms of dollars and resources?
- Is adequate time available to develop and implement the approach?
- What impact do these approaches have on the overall program schedule?
- What impact will the control approach have on the technical performance of the system?

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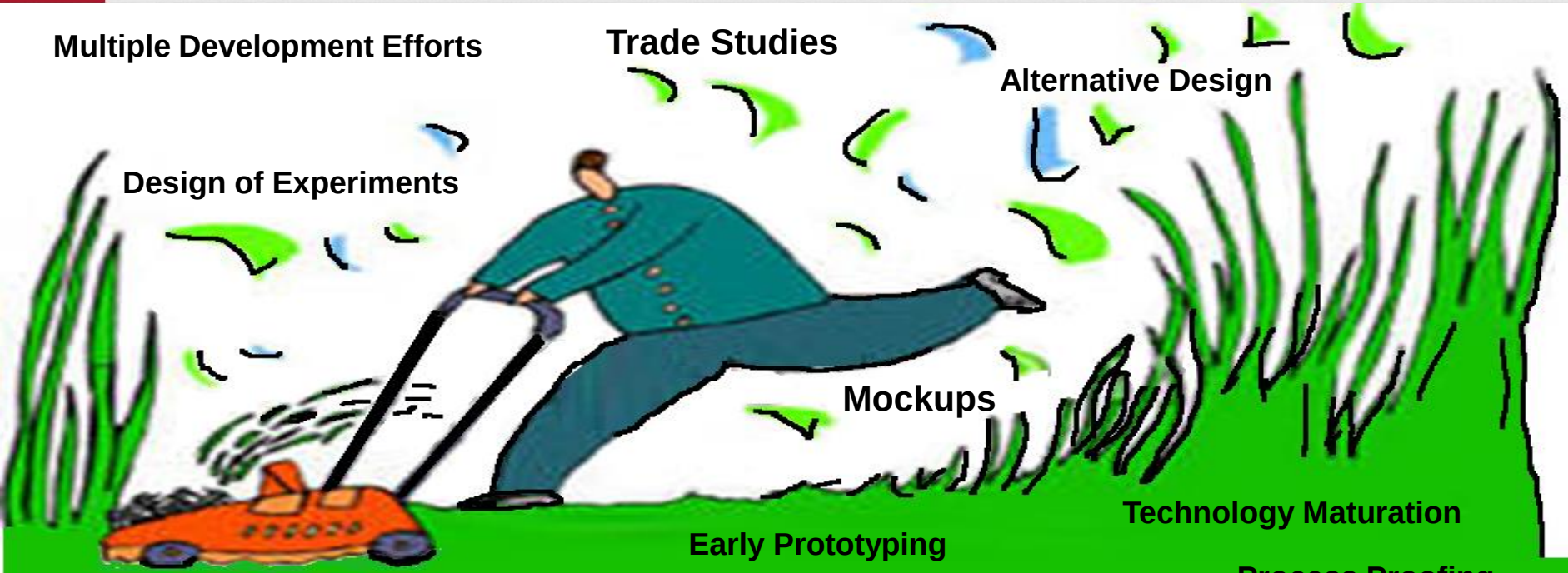
RISK CONTROL APPROACHES



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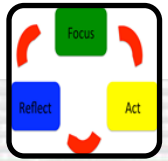
RISK BURN-DOWN

A risk burn-down plan generally consists of 6 steps:

1. Identify and organize activities in sequence manner, using realistic and logical schedule precedence, typically a finish-to-start.
2. Ensure all risk mitigation activities (1) are clearly defined, (2) are objective, not subjective, and (3) have specific, measurable outcomes.
3. Assign a planned likelihood and consequence value to each risk mitigation activity.
4. Estimate the start and finish dates for each risk mitigation activity.
5. Include the risk mitigation activities in the program IMS. Update the IMS for mitigation of emergent risks
6. Chart the relationship of risk mitigation activities, plotting risk level versus time to estimate their relative risk burn-down/reduction contribution.

RISK PILE



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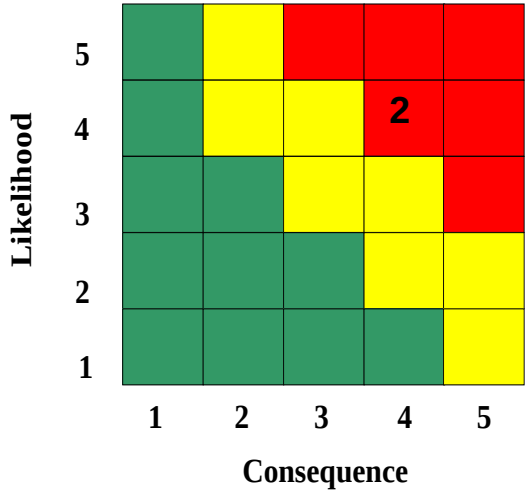
RISK CONTROL PLAN EXAMPLE

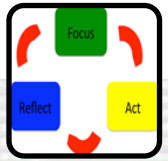
Identify, evaluate, and select detailed steps that will drive risk to an acceptable level given program constraints and objectives

1. Get new/detailed Program A and SW schedules
2. Identify insertion points for SW updates
3. Work with SW contractor to improve schedule
4. Incentivize SW lab construction for schedule
5. Identify root cause of SW technical issues
6. Correct SW technical issues
7. Improve SW schedule by 2 months
8. Improve SW lab construction by 1 month
9. New SW dates coordinated with Program A leadership



EXAMPLE

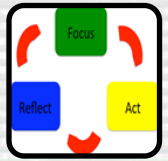
Risk #2: If the timeline established for Program A's production is not met because of a delay in receiving software updates, then there will be a program slip of at least 4 months.



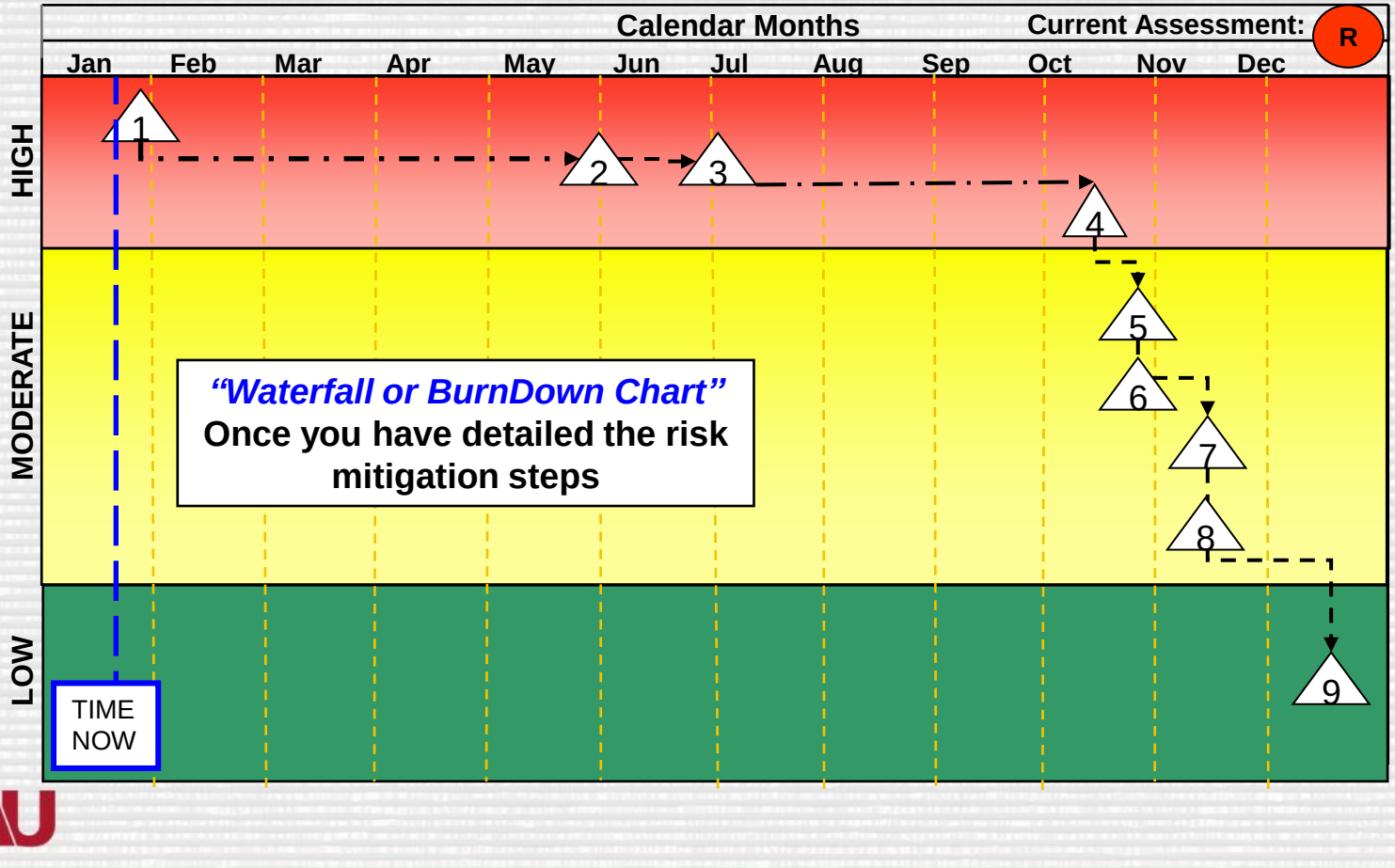
RISK CONTROL PLAN EXAMPLE

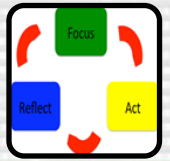
Include the specifics of what should be done, when it should be accomplished, who is responsible, and funding required to implement mitigation strategy

	When?	Who?	Funding?
1. Get new/detailed Program A and SW schedules	Jan 12	CC	Yes
2. Identify insertion points for SW updates	May 12	Tech Dir	Yes
3. Work with SW contractor to improve schedule	July 12	You?	No
4. Incentivize SW lab construction for schedule	Oct 12	x	No
5. Identify root cause of SW technical issues	x	x	x
6. Correct SW technical issues	x	x	x
7. Improve SW schedule by 2 months	x	x	x
8. Improve SW lab construction by 1 month	x	x	x
9. New SW dates coordinated with Program A leadership	x	x	x



MITIGATION TRACKING TOOL
BURNDOWN or WATERFALL





RISK MITIGATION?

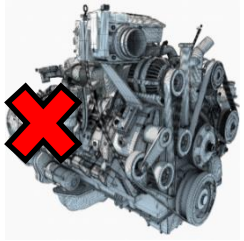
Why?

Meet Availability Requirements

Mitigate?

Not My Problem

Change Availability Requirement



Why?

Engine Does Not Start

Mitigate?

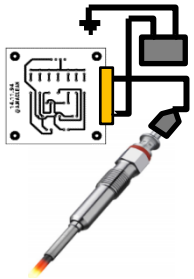
Start Engine in Warmed Shelter

Why?

Glow Plug Failure

Mitigate?

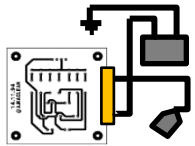
More Spare Glow Plugs



Why?

Glow Plug Remains On After Start

Mitigate?



Circuit Redesign

Why?

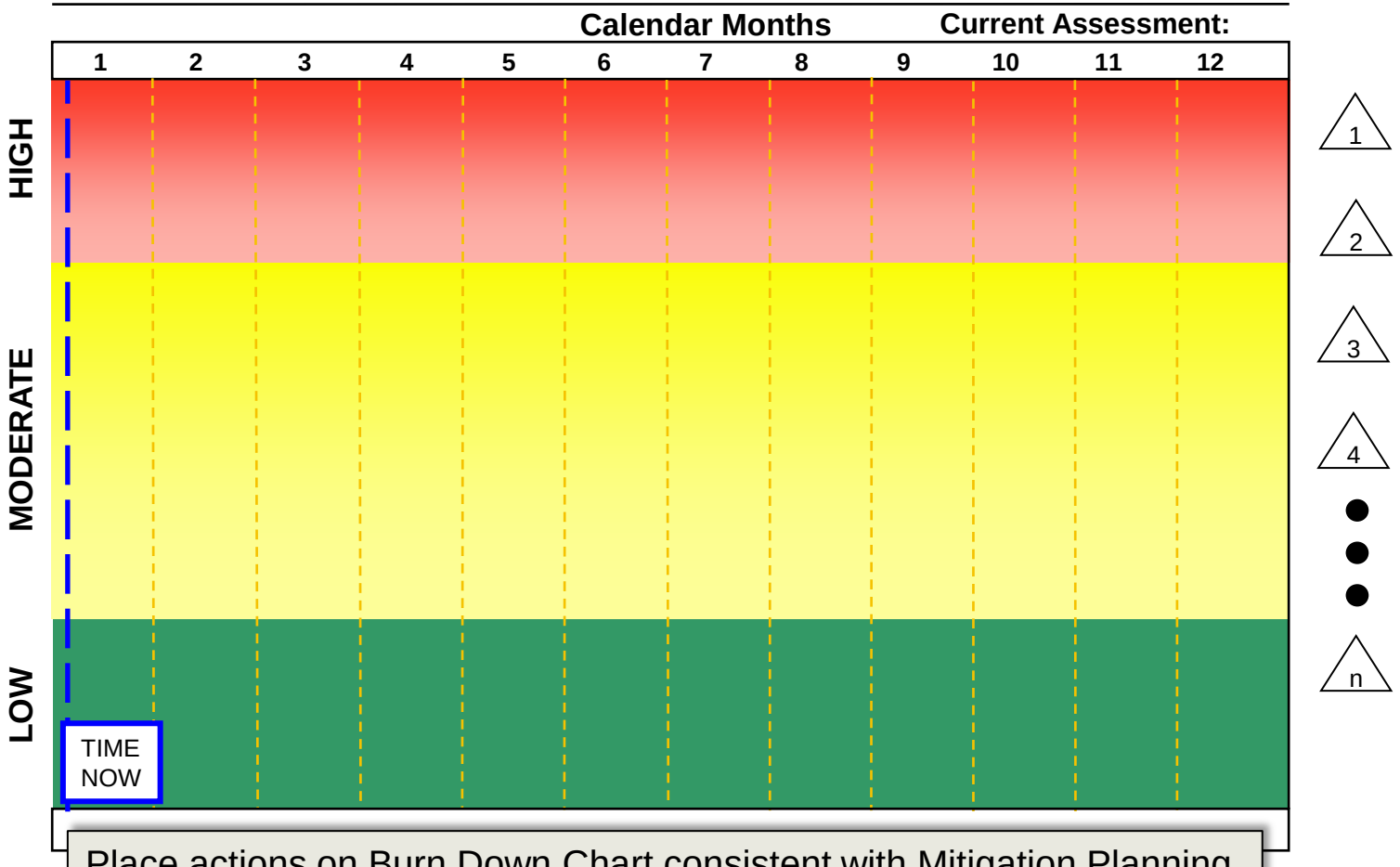
Counterfeit Circuit Boards

Mitigate?

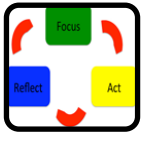
Certified Supplier

EXERCISE: RISK MITIGATION

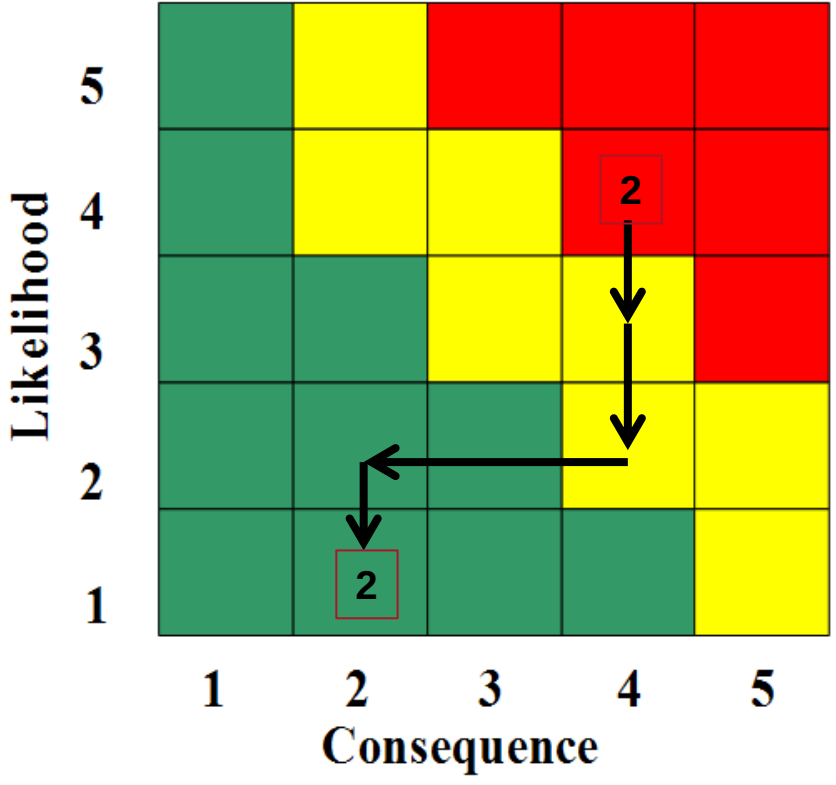
BURN DOWN TEMPLATE



Place actions on Burn Down Chart consistent with Mitigation Planning



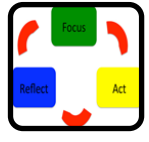
RISK MATRIX TEMPLATE



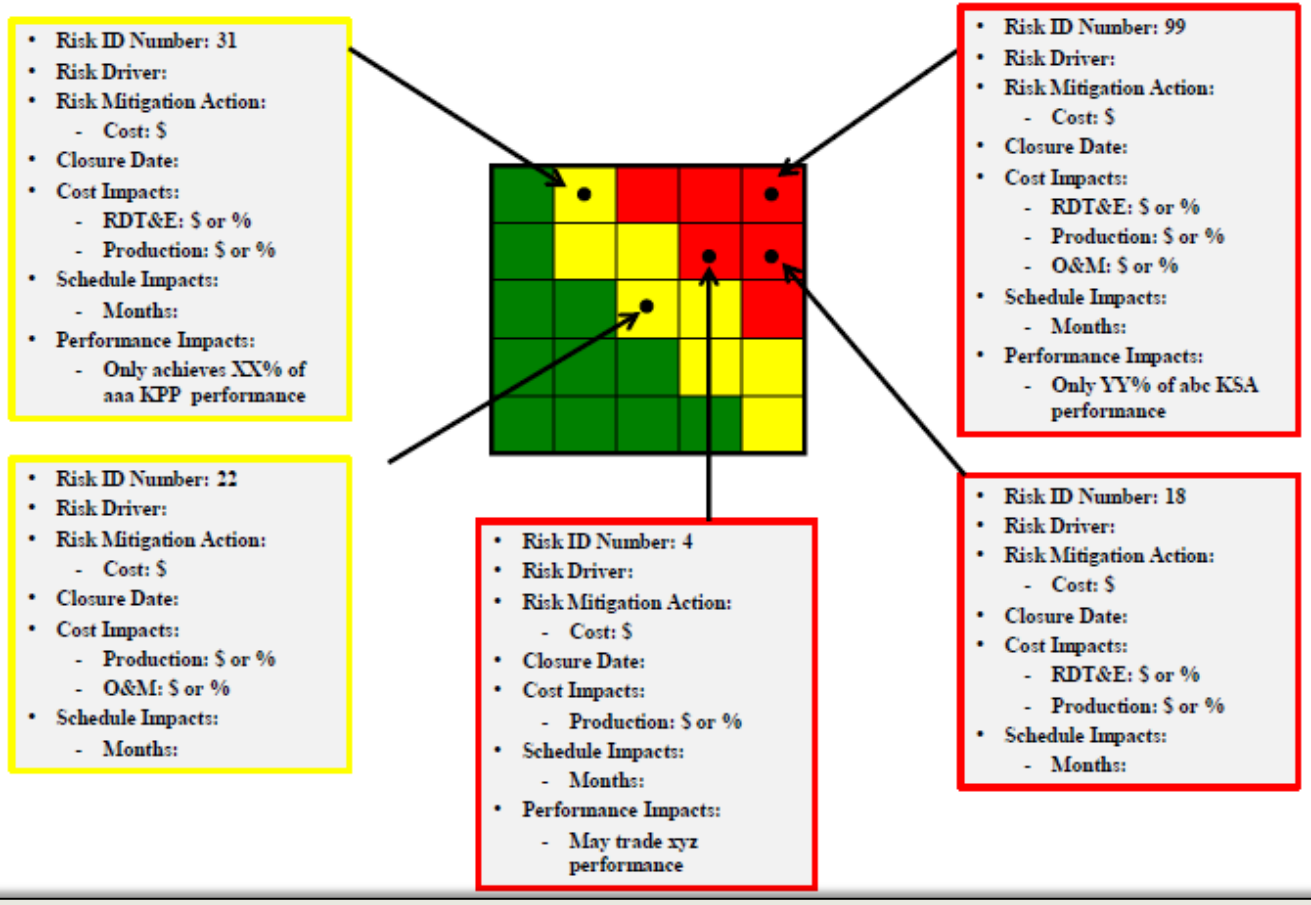
Adjust Risk Matrix Expectation consistent with Mitigation Planning

BURN DOWN ACTIONS TEMPLATE

Action	When?	Who?	Funding?
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			



RISK REPORTING MATRIX

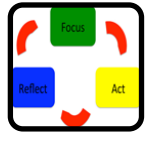


Adjust Risk Reporting Matrix Expectations consistent with Mitigation Planning

RISK REGISTER

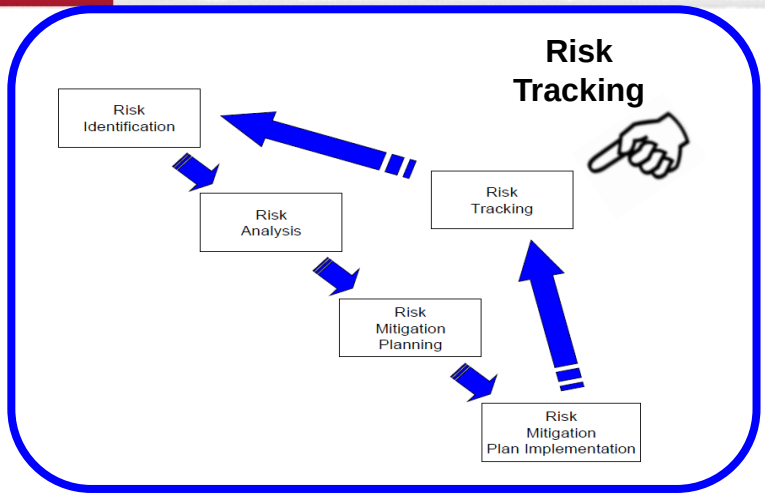
Risk Number	Linked WBS/IMS ID#	Owner	Type of Risk	Status	Tier	Risk Event	Likelihood, Consequence Rating	Risk Handling Strategy	Risk Identified Date	Risk Approval Date	Planned Closure Date	Target Risk Rating	Plan Status

Populate Risk Register to reflect Risk Event and Risk Handling

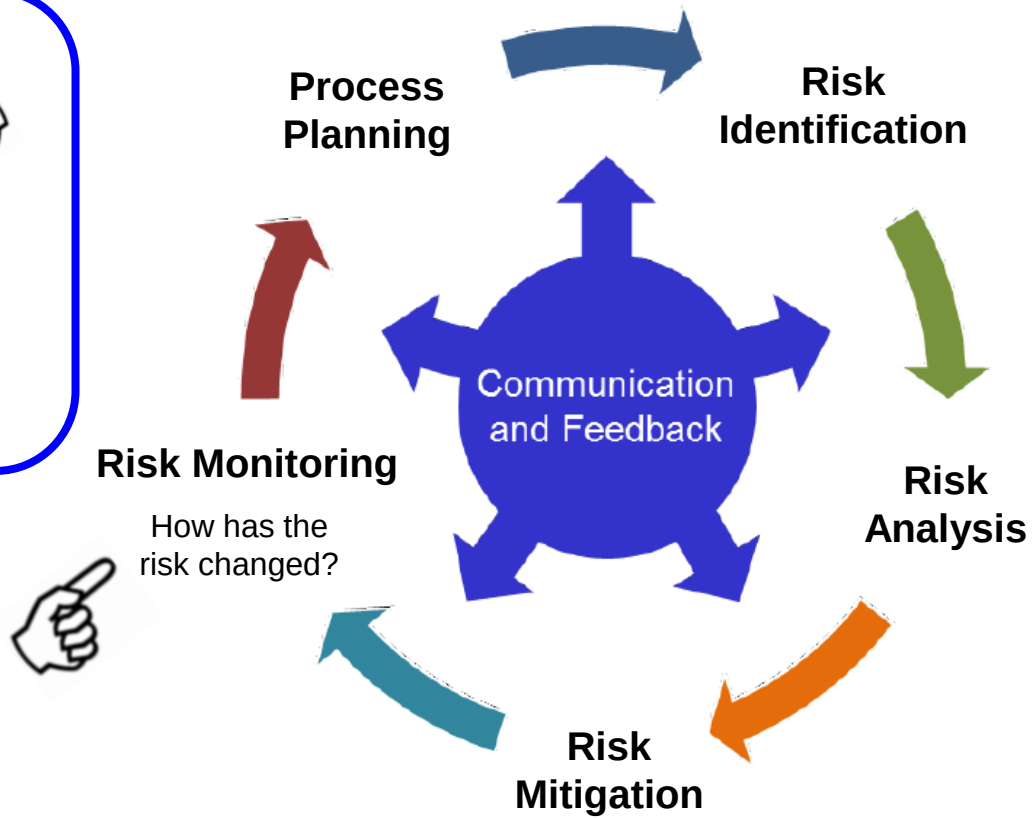


Risk Monitoring

RISK MONITORING



DoD RMG v6.0 2005



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RISK MONITORING

Answers the question: *"How have the risks changed?"*

A means to systematically **track** and **evaluate** risk handling plans against established metrics throughout the acquisition process

Iterative and **recursive** - feeds info back thru risk handling, risk analysis, risk identification, and risk mgt planning steps as warranted

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RISK MONITORING

When Monitoring Risks:

- Track the implementation and progress of the risk handling
- TPMs are an integral risk monitoring activity
- Conduct regular status updates to monitor risks for changes to likelihood and/or consequences
- Document active risks as well as those that can be retired - prevent unnoticed relapse of retired risks
- Keep lines of communication open to notify management when ability to handle the risk is ineffective

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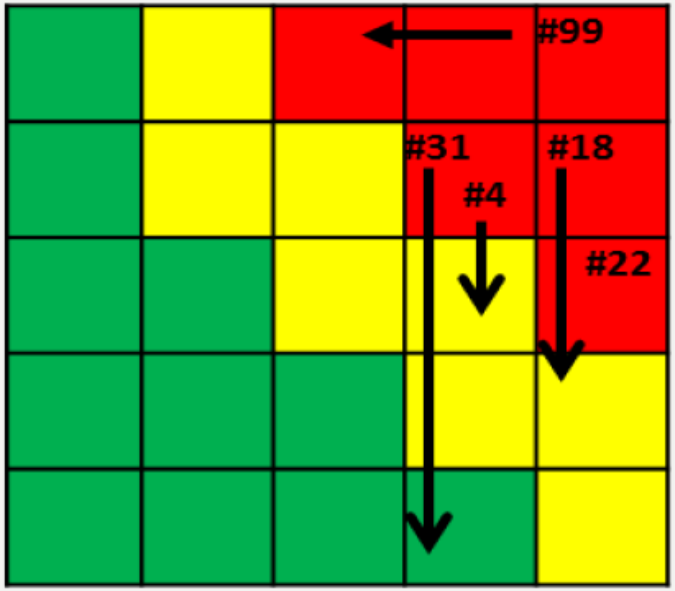
EXAMPLE RISK MONITORING AND TREND MATRIX



Risk No	Risk Item Description	Risk Trend
31	Risk Title	↓
4	Risk Title	↓
18	Risk Title	↓
99	Risk Title	←
22	Risk Title	Retired

↓ = Likelihood decreasing
↑ = Likelihood increasing
← = Consequence decreasing
New = New risk added
Retired = Retired since last report

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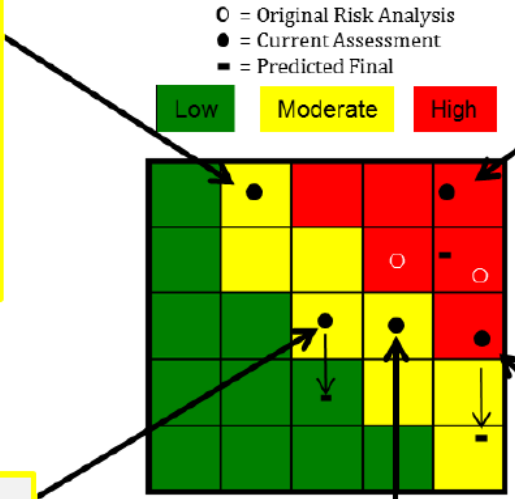
- Risk ID #82: Risk Statement…
- Consequences if Realized:
  - Cost -
  - Performance -
  - Schedule -
- Handling, including mitigation, Activities:
  1. Summarize Key Activity 1
  2. Summarize Key Activity 2
  3. Etc.
- Planned Closure Date:



- Risk ID #85: Risk Statement…
- Consequences if Realized:
  - Cost -
  - Performance -
  - Schedule -
- Handling, including mitigation, Activities:
  1. Summarize Key Activity 1
  2. Summarize Key Activity 2
  3. Etc.
- Planned Closure Date:

- Risk ID #23: Risk Statement…
- Consequences if Realized:
  - Cost -
  - Performance -
  - Schedule -
- Handling, including mitigation, Activities:
  1. Summarize Key Activity 1
  2. Summarize Key Activity 2
  3. Etc.
- Planned Closure Date:

- Risk ID #45: Risk Statement…
- Consequences if Realized:
  - Cost -
  - Performance -
  - Schedule -
- Handling, including mitigation, Activities:
  1. Summarize Key Activity 1
  2. Summarize Key Activity 2
  3. Etc.
- Planned Closure Date:

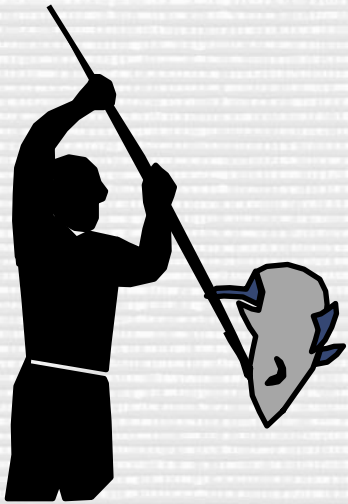
- Risk ID #97: Risk Statement…
- Consequences if Realized:
  - Cost -
  - Performance -
  - Schedule -
- Handling, including mitigation, Activities:
  1. Summarize Key Activity 1
  2. Summarize Key Activity 2
  3. Etc.
- Planned Closure Date:

Figure 3-12. Sample Program Tier 1 Risk Reporting Format

RISK MONITORING EXPECTATIONS

Expectations

- The program team conducts regular status updates to monitor risks for any changes to likelihood or consequence, as well as earned value (cost variance), TPMs, and variation in schedule as a result of program progress.
- PMOs and contractors establish a regular schedule for reviewing risks.
- Team alerts management when risk handling plans should be implemented or adjusted.



- Alert the next level of management when ability to handle a risk exceeds the lower level's authority or resources.

- Program team tracks actual versus planned implementation of progress against the risk handling plan.
- Program establishes a management indicator system over the entire program to monitor risk activity.
- Program reviews closed risks periodically to ensure their risk level has not changed.

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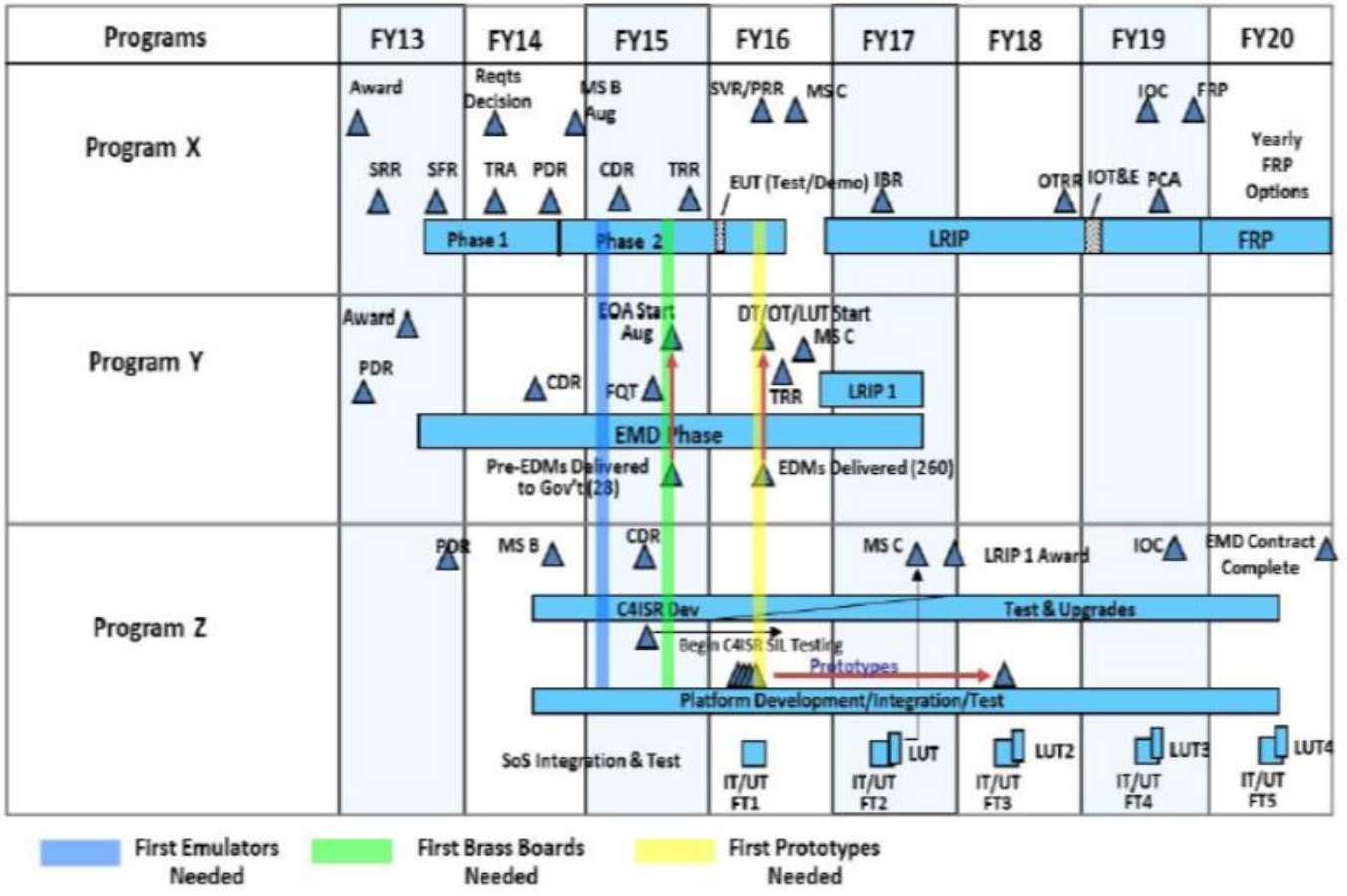
CROSS-PROGRAM RISKS (SCHEDULES)



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CROSS-PROGRAM RISKS (MANAGEMENT)

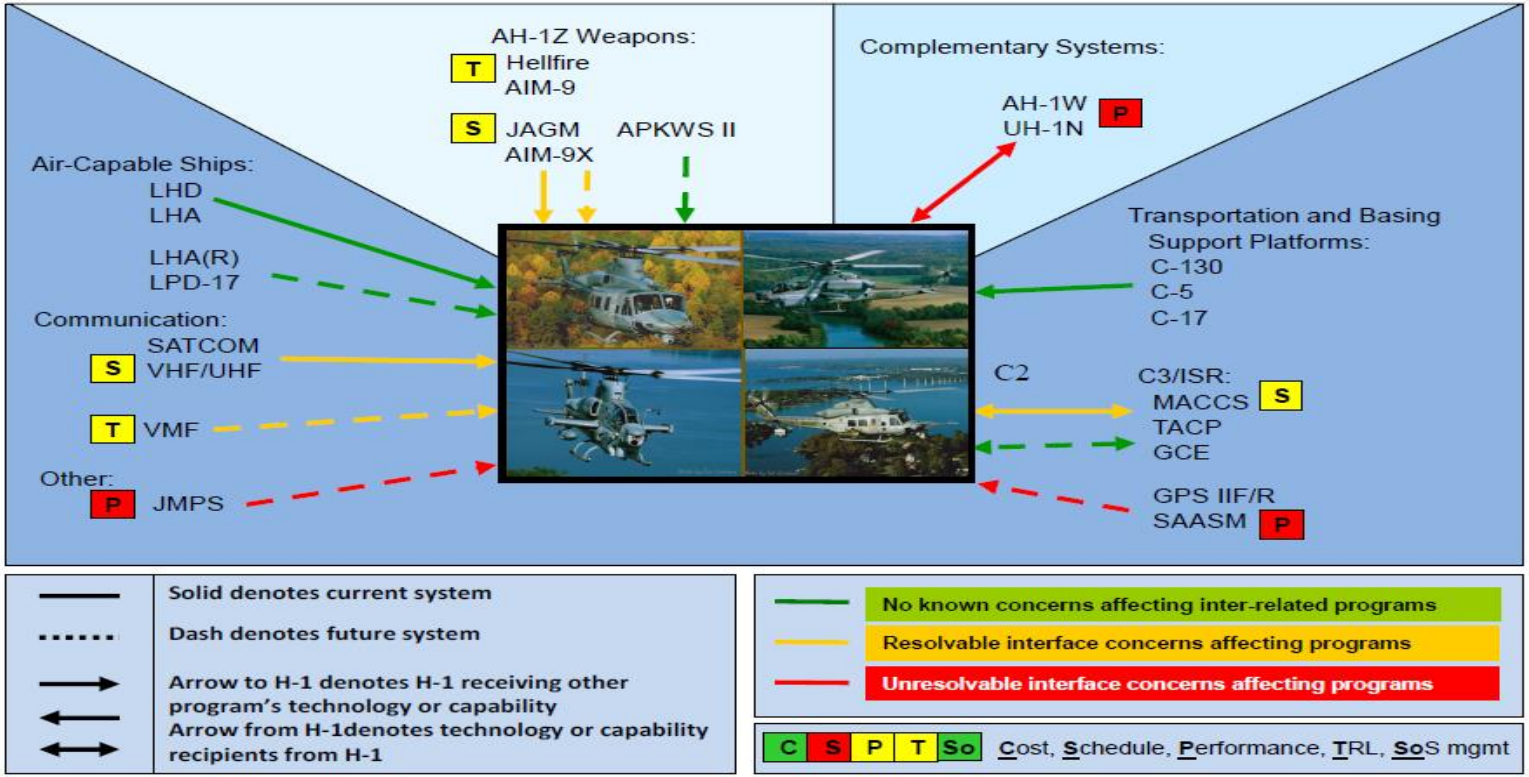

Figure 7-2. Tracking Interdependency Risks

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RISK BURN-DOWN

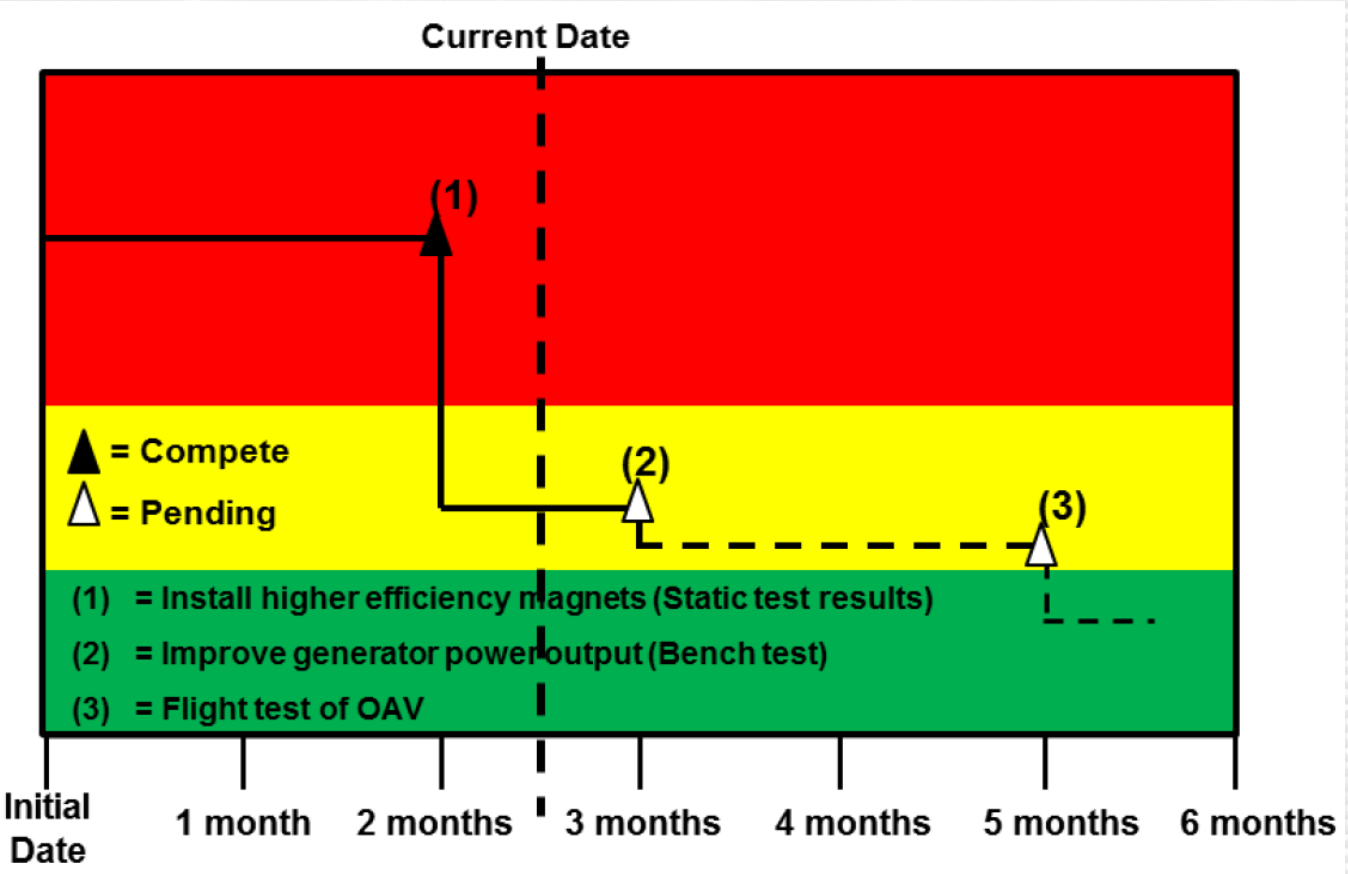

Figure 3-9. Risk Burn-Down

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ALTERNATE RISK MATRIX

3. Alternative Risk Reporting Format

Risk	Likeli-hood (1-5)	Consequences					Handling Activities	Planned (P) Actual (A)		Closure Date
		Cost			Schedule	Performance				
		RDT&E	Procurement	O&S			Activity	Date	Cost	
Risk 1 (describe the risk in terms of, "if... (something does or does not occur), then....(negative consequence X and Y will happen)	3	$450k			4 months	XX performance degraded	1 –Activity XX	(P) 6/16/14	(P)	(P) 8/12/15
								(A)	(A)	
							2 –Activity YYY	(P) 10/12/13	(P)	
								(A) 11/1/13	(A)	(A)
							3 – Activity ZZZ	(P) 8/12/15	(P)	
								(A)	(A)	
Risk 2	4		$2.2M		8 months		1 –Activity aaa	(P) 7/13/14	(P)	(P)7/13/14
								(A)	(A)	
							2 -	(P)	(P)	
								(A)	(A)	(A)
							3 -	(P)	(P)	
								(A)	(A)	
Risk 3	2		$520K		2 months		1 -	(P)	(P)	(P)
								(A)	(A)	
							2 -	(P)	(P)	
								(A)	(A)	(A)
							3 -	(P)	(P)	
								(A)	(A)	

Insert risk statement in this column

Insert assessed likelihood rating for the risk

Briefly describe the cost, schedule, and performance consequences of the risk

Summarize the key handling activities

Show the planned and actual completion dates and cost for each activity

List the planned and actual risk closure dates

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RISK MANAGEMENT TOOLS

PMT 257_DAY 4_RISK MANAGEMENT TOOLS ACTIVE RISK MANAGER

Description

Active Risk Manager (ARM) is a comprehensive enterprise risk management (ERM) software package, in use in over 170 of the globe's most respected and demanding organizations, projects and supply chains.

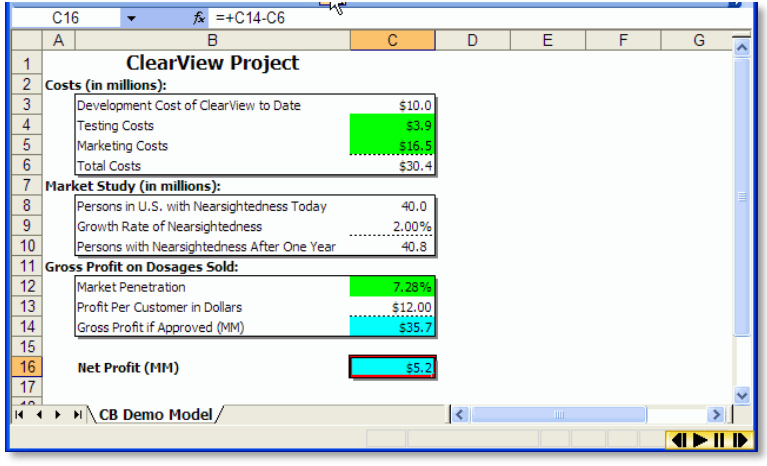
Features

- Extensive range of ERM capabilities
- Management of project and program risk
- Strategic enterprise oversight
- Delivers an integrated approach to identifying, documenting, mitigating, monitoring and analyzing risks and opportunities in all business functions
- Easily configured to support a range of business domains and processes
- A single web-based system for managing risks and opportunities can be used
- Integration of risk management across operations and projects
- Replaces silo-based, spreadsheet approach to risk management with a single integrated ERM system
- Provides top-down, bottom-up and cross organizational views of risks and opportunities

Active Risk
http://www.activerisk.com/solutions/active-risk-manager-arm/

Description

Oracle Crystal Ball is a spreadsheet-based application suite for predictive modeling, forecasting, simulation, and optimization. It gives insight into the critical factors affecting risk.



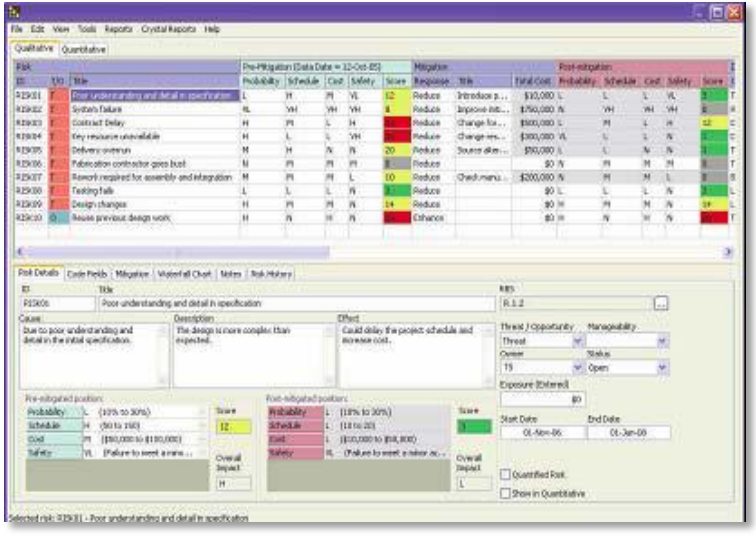
Features

- Uses Monte Carlo Simulation
- Identify and mitigate the key inputs that drive risk
- Automatically calculates and records the results of thousands of different "what if" cases
- Analysis presents range of possible outcomes, their probability of occurring, the inputs that most impact your model, and where you should focus your efforts
- Allows you to work as a team, sharing models and data
- Uses spreadsheet technology that you already own
- Allows you to share your findings through graphs, charts, and reports that present and communicate the results of your analyses

Crystal Ball
http://www.oracle.com/us/products/middleware/bus-int/crystalball/index-066566.html

Description

Oracle's Primavera Risk Analysis is a full lifecycle risk analytics solution integrating cost and schedule risk management.



Features

- Helps identify common scheduling pitfalls that may result in misleading schedule or risk analysis results
- Integrates pre-developed risk registers and defines new risk registers
- Addresses full lifecycle risk management through advanced Monte Carlo-based cost and schedule analytics
- Reports confidence levels with regards to finish dates, costs, float, internal rate of return and net present value
- Integrates project schedules and cost estimates to model risks and uncertainty
- Determines contingency and risk response plans
- Provides a comprehensive means of reporting project confidence levels
- Risk-loads projects through risk registers and risk templates before using Monte Carlo simulation to analyze them
- Provides variety of reports, including risk histograms, tornados, and scatter plots

Primavera Risk Analysis
http://www.oracle.com/us/products/applications/042371.htm

PMT 257_DAY 4_RISK MANAGEMENT SOFTWARE TOOLS — TOOLS COMPARISON

	@Risk	Risk Radar® Enterprise	Active Risk Manager	Crystal Ball	Primavera Risk Analysis
Microsoft Project Integration?	No	No	Yes	Yes	Yes
Microsoft Excel Integration?	Yes	No	Yes	Yes	---
Use of graphs and charts?	Yes	Yes	Yes	Yes	Yes
Monte Carlo Simulation?	Yes	No	---	Yes	Yes
Customizable Features?	Yes	Yes	Yes	Yes	---
Web-based?	No	Yes	Yes	Yes	Yes
What stands out?	• Simulations are calculated 10 X within Excel • Compatibility: Compatible with PC Excel 2000 and higher and PC Windows 2000 and higher.	• Supports guidance from the PMI PMBOK®, IEEE, SEI CMMI and DoD Risk Management Guide for DoD Acquisition •NMCI Certified; ATO Army EIS network •Compatible with MySQL 5 or newer, Oracle 8ior newer , SQL Server 2000 or newer. Used by Govt contractors and Govt agencies.	• Compatible with Microsoft SQL Server and Oracle databases, Microsoft Reporting Services and SharePoint. •Interfaces with Microsoft Excel, Microsoft Project, Primavera, Telelogic DOORS and Cradle.	• Compatible with Microsoft Excel 2002 (XP), 2003 with Service Pack 3, or Microsoft Excel 2007 with Service Pack 2, Microsoft Internet Explorer 7.0 and 8.0.	---
Possible shortcomings	---	• Oracle database requires a separate 3rd party driver.	---	---	---

--- indicates no data found

Issue Management

ISSUES VS RISKS

Risks are potential future events

An issue is an event or situation with negative consequences that has already occurred or is ***certain*** to occur

This distinction between an issue and a risk differentiates how they are managed.

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ISSUES VS RISKS

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ISSUES VS RISKS

Figure 5-2. Issue Reporting Matrix

- Approved issues should be analyzed using the program's risk management consequence criteria
- The program should evaluate the handling options in terms of cost, schedule, performance, and residual risk,

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Opportunity Management

OPPORTUNITY MANAGEMENT OVERVIEW

Through the opportunity management process, the program identifies potential enhancements to cost, schedule, and/or performance.

Opportunity management measures potential program improvement in terms of likelihood and benefits.

- **Opportunities should be evaluated for both advantages and disadvantages**
  - opportunity may be overstated and corresponding risks may be understated
  - all candidate opportunities should be thoroughly screened for potential risks

OPPORTUNITY MANAGEMENT PURPOSE

Opportunities Help Deliver Should-Cost Objectives

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OPPORTUNITY MANAGEMENT PROCESS

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OPPORTUNITY TRACKING REGISTER

Opportunity	Likeli-hood	Cost to Implement	Benefit					Oppor-tunity Level	Handling Strategy	Expected Closure
			Cost			Schedule	Performance			
			RDT&E	Procurement	O&M					
Opportunity 1: Procure Smith rotor blades instead of Jones rotor blades.	Mod	$3.2M			$4M	3 month margin	4% greater lift	Moder-ate	Reevaluate - Summarize the handling plan	March 2017
Opportunity 2: Summarize the opportunity activity.	Mod	$350K	$25K		$375K			Low	Reject	May 2017
Opportunity 3: Summarize the opportunity activity.	High	$211K		$0.4M	$3.6M	4 months less long-lead time needed		High	Summarize the handling plan to realize the opportunity	January 2017

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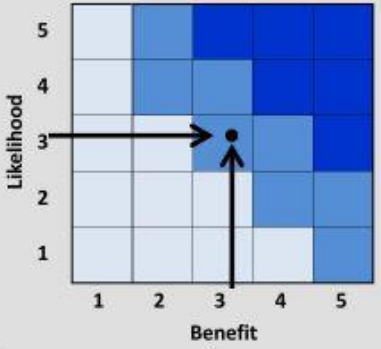
OPPORTUNITY MANAGEMENT SAMPLE

Level	Likelihood	Probability of Occurrence
5	Near Certainty	> 80% to ≤ 99%
4	Highly Likely	> 60% to ≤ 80%
3	Likely	> 40% to ≤ 60%
2	Low Likelihood	> 20% to ≤ 40%
1	Not Likely	> 1% to ≤ 20%



Level	Cost			Schedule	Performance
	RDT&E	Procurement	Operations & Maintenance		
5	Significant cost benefit of >$W; or reduces costs by >q% of budget	Significant cost benefit of >$D or; reduces production unit cost by >q%	Significant cost benefit for O&M savings	Exceptional benefit in meeting major milestones and improving critical path	Exceptional benefit to design margin, system performance and requirements
4	Major cost benefit $Z - <$W; or reduces costs by p% - <q% of budget	Major cost benefit of $C - <$D or; reduces production unit cost by p% - <q%	Major cost benefit for O&M savings	Major benefit in meeting major milestones and improving critical path	Major benefit to design margin, system performance or requirements
3	Cost benefit of $Y - <$Z; or reduces costs by n%- <p% of budget	Moderate cost benefit of $B - <$C or; reduces production unit cost by n% - <p%	Moderate Cost benefit for O&M savings	Moderate benefit in meeting major milestones	Moderate benefit to design margin, system performance or requirements
2	Minor cost benefit of $X - <$Y; or reduces costs by m%- <n% of budget	Minor cost benefit of $A - <$B or; reduces production unit cost by m%- <n%	Minor cost benefit for O&M savings	Minor benefit in meeting lower level milestones	Minor benefit to design margin, system performance or requirements
1	Minimal cost benefit of <$X; or reduces costs by <m% of budget	Minimal cost benefit of <$A or; reduces production unit cost by <.5%	Minimal cost benefit for O&M savings	Minimal benefit to improving overall schedule	Negligible benefit to design margin, system performance or requirements

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DAU RM WORKSHOP OVERVIEW

- Risk Management Overview
- Risk Management Process
  - Planning
  - Identification
  - Analysis
  - Handling (Mitigation)
  - Monitoring (Tracking)
  - Tools
- Issue Management
- Opportunity Management
- Next Steps

DAU RISK MANAGEMENT WORKSHOP NOTIONAL AGENDA

One Day Workshop

Intro	Risk **Planning**	Risk **ID**	Lunch	Risk **Analysis**	Risk **Handling**	Risk **Monitoring**

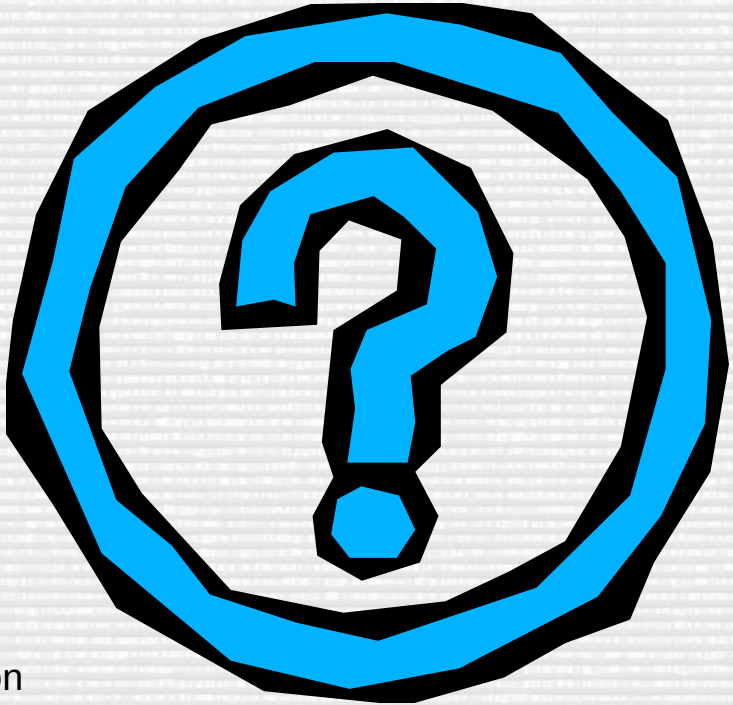
Two Day Workshop

Intro	Risk **Cluture**	Risk **Planning**	Lunch	Risk ID Part 1	Risk ID Part 2

Risk Analysis	Risk Handling Part 1	Lunch	Risk **Handling** Part 2	Risk **Monitoring**	Risk Tools

Intended to use actual Program Data with Intact Teams to jump-start / invigorate Risk Management activities to enable program success.

QUESTIONS



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