



NORTHROP GRUMMAN

DEFINING THE FUTURE

A Systems Approach to Applying Risk Management to Software Development

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- Risk management has proven to be very successful during program execution in helping program managers avoid many problems that had been found to be common during program execution.
- Past presentations have encouraged fellow practitioners, customers and suppliers to make risk management an important part of their overall project management process
- This presentation suggests an approach to expanding the scope of risk management from a project life cycle view to a broader product life cycle view

Agenda

The Challenge: Starting Risk Management During Project Execution

The Solution: Using a Systems Approach to Get the Most Out of Risk Management

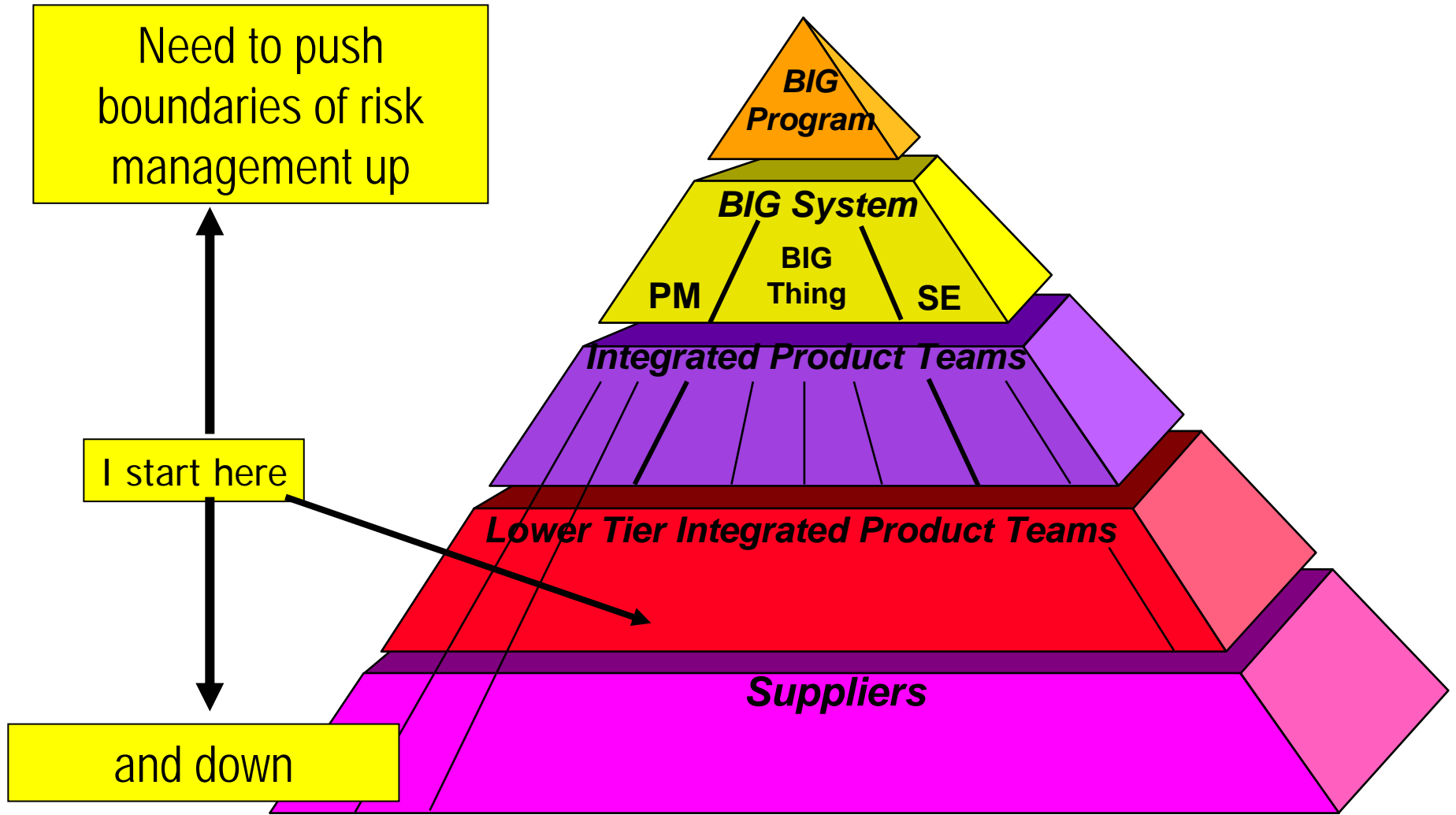
Success: Some Results of Implementing a Systems Approach

- The best solutions use a top down/bottom up approach
 - Technicians and Engineers tend to provide a bottom up approach
 - Project Managers and Systems Engineers tend to provide a top down approach
- The bottom up approach usually approaches its limit at the project level
- Risk Management activities are often started at the wrong point in the acquisition life cycle
- How can a Systems Engineers approach extend the scope of risk management beyond the project level?

What is Risk Management?

- That part of the project/group's management system that deals with risks
- The method
 - for addressing **possible** problems
 - before** they occur
- by consciously focusing on what could adversely affect product quality, costs and schedules and **doing** something about them
- Risk management is **proactive**
 - Managers see opportunities in preventing problems
 - Steps are taken to prevent or avoid problems
 - Resources are allocated, Agreements are made
 - Concerns are welcomed
- The key point is "EARLY ENOUGH" to be effective. If not, we go into a reactive mode

A Bottoms Up Approach Can Only Promulgate Risk Mgmt Vertically Within the Scope of the Project



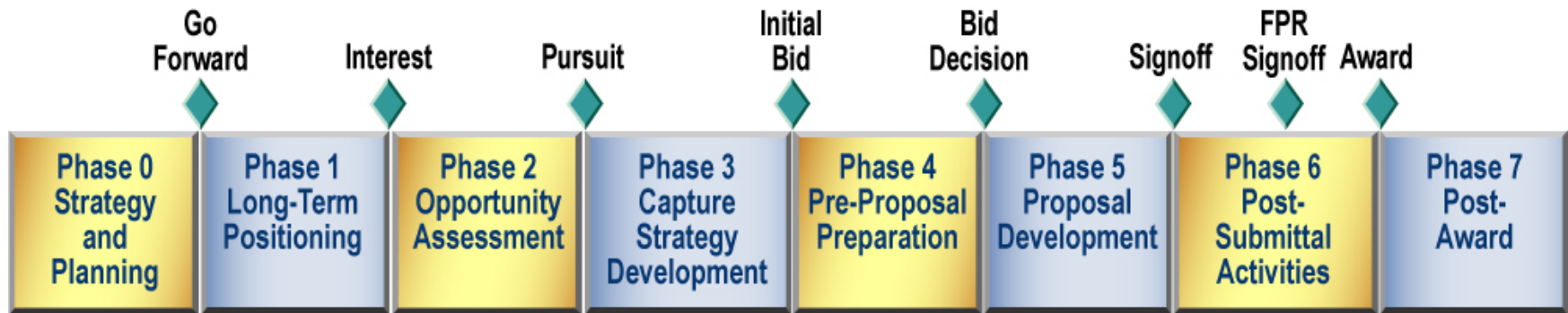
Projects Can Expand Risk Management Vertically

Risk Management is important at all levels
(including Customer and Suppliers)

- Emphasize the importance of not ignoring risks
 - **Do not just accept risks**
 - Realize the value in proactively managing them
- Comprehensive identification of risks is key
 - Everyone should be involved - engineers and **support personnel** see different risks than managers do.
- NGC and **suppliers** must understand the customer's perception of the risks and shape the customer's perception of NGC risks
 - Lack of communication creates risks
- **Customers** are becoming more insistent on good risk management as a major factor in acquisition selection
 - Good risk mitigation strategies are excellent proposal discriminators



Once Maximized, Next Opportunity is Horizontal Expansion



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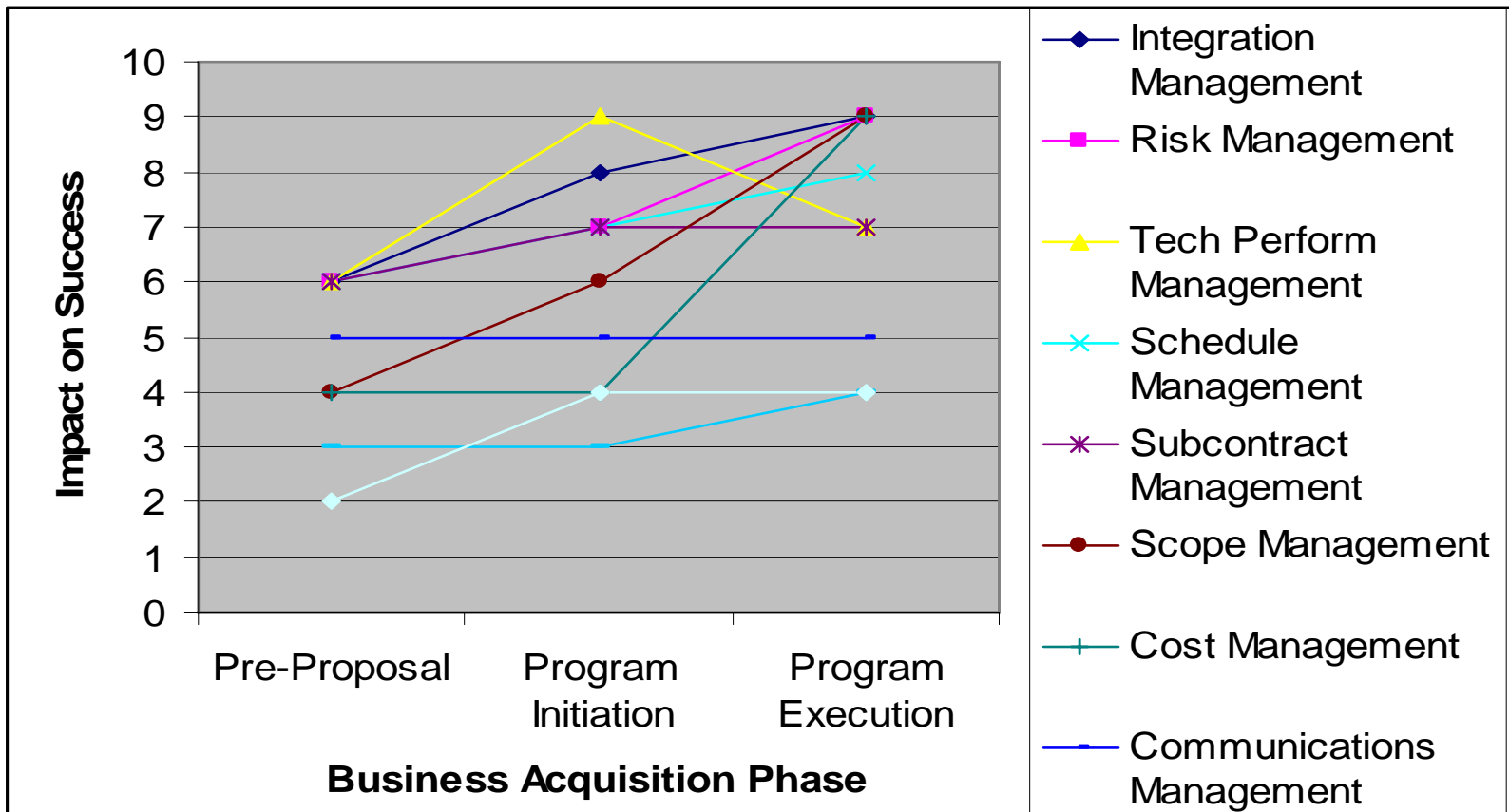
Need to push boundaries of risk back, before project start

Risk Management Activities Are Often Started at the Wrong Point In The Product Life Cycle

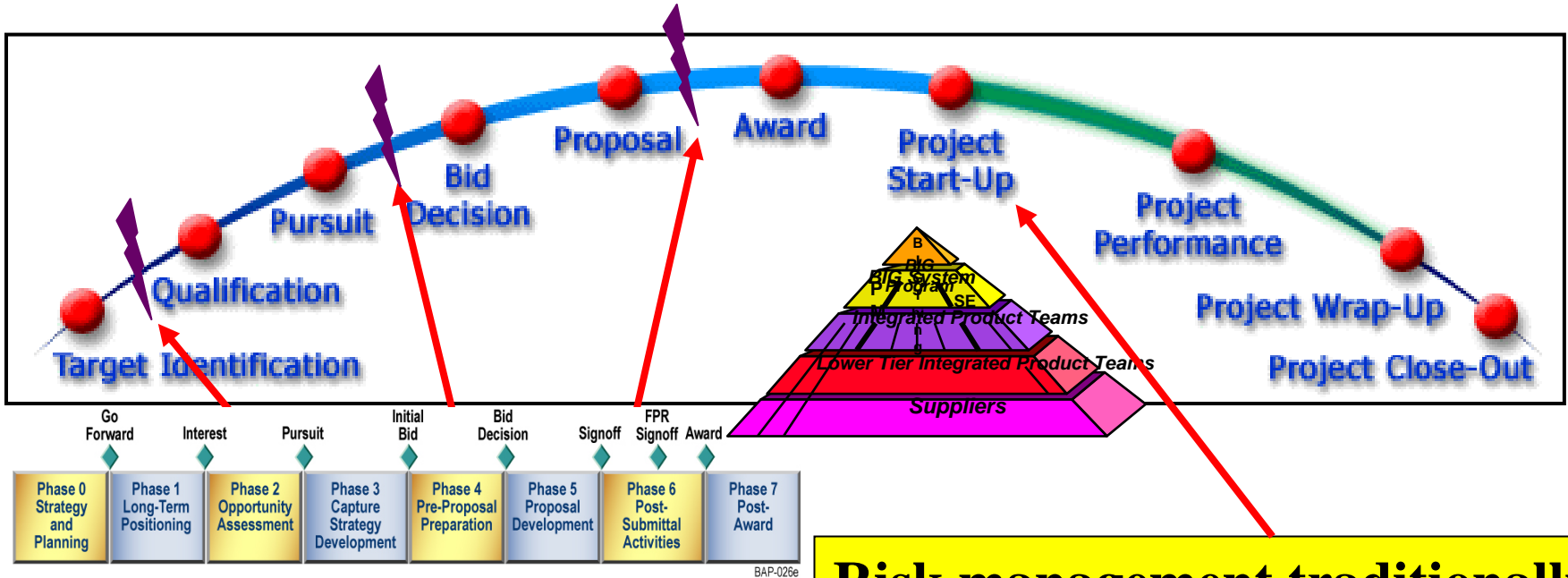
- If a project manager begins planning for risk management at project start up, it is already too late
- Many program execution problems occur as risk candidates early in the product life cycle, e.g. during the early acquisition phases
- Opportunities for optimal implementation of risk mitigation strategies occur well before program execution starts

Risk Management is Highly Effective on Projects, But Not in Earlier Phases of the Product Life Cycle

- As the life of the product approaches and reaches the program execution phase, the positive impact of risk management increases



The Root Cause



Risk management traditionally starts or restarts here with no continuity with earlier teams

The results of early risk management efforts are often lost as new teams take over

Why? Because:

- Risks that are missed during the early phases of the acquisition life cycle are realized as problems during project start-up and execution
 - Budget and schedule goals are soon missed
 - Program scope is scaled back
 - Requirements are not fully implemented and tested
- Crisis management is the result of starting risk management late in the product life cycle
 - Managers spend more time putting out fires than producing quality products
 - Project heroes are needed, disrupting efficient team operations
 - When project heroes are consumed fighting fires, they are not able to focus on helping customers and the company attain their goals

- Senior management has worked for several years to “push back” the consistent and systematic use of risk management to earlier phases of the business acquisition process
- Current direction is for all proposals to look for risks to program execution success
- Emerging direction is that during the eight phases that precede project contract award, a basic area of involvement for Mission Assurance is to focus on risk management, including using a risk management tool to capture initial risks
- Mission Assurance has expanded its mandate to provide support to each individual program’s success well before program startup

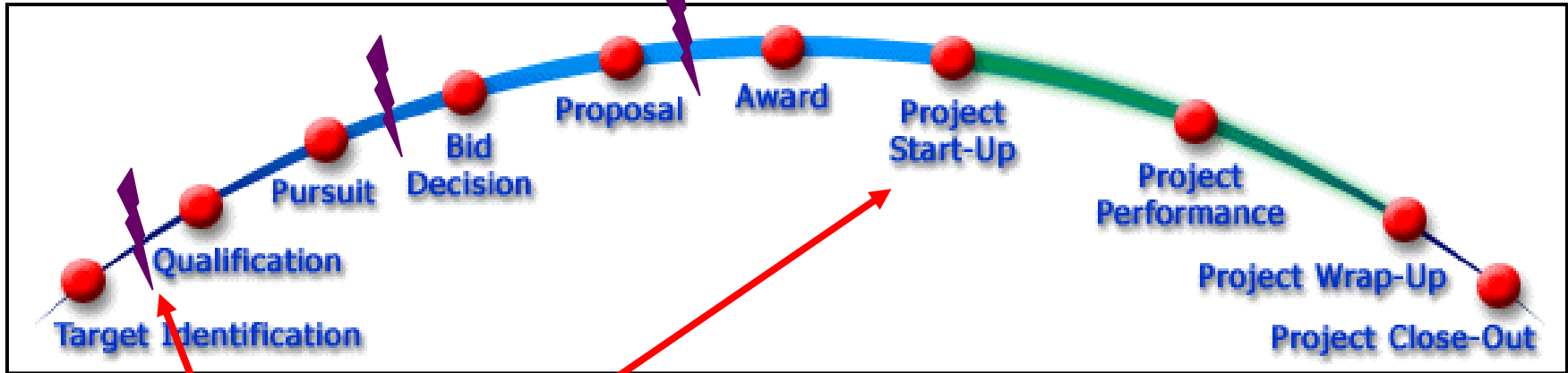
The Solution: Mission Assurance Can Provide an Enterprise Level Approach to Risk Management

- Mission Assurance is the disciplined application of systems assurance, quality assurance, supplier assurance, and program assurance principles to help achieve 100% mission success



Mission Assurance employs the disciplined application of risk management as part of program assurance

Cover the entire Product Life cycle, not just the program/project



**Risk management
traditionally starts here**

**Many risk candidates
should be identified here**

A Properly Structured Mission Assurance Function Can Address The Challenge

- The NGMS Mission Assurance function is high enough in the organization above, program execution management, to address this challenge
- The Mission Assurance Life-Cycle straddles the program start up and execution phases of the acquisition life cycle
- Approximately 50% of program execution problems can be avoided by addressing risk items in areas targeted by Mission Assurance during the business acquisition process phases preceding contract award

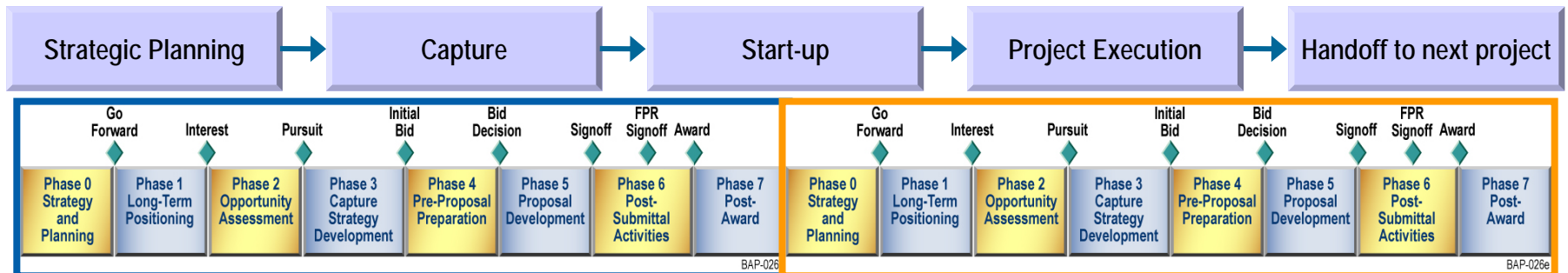
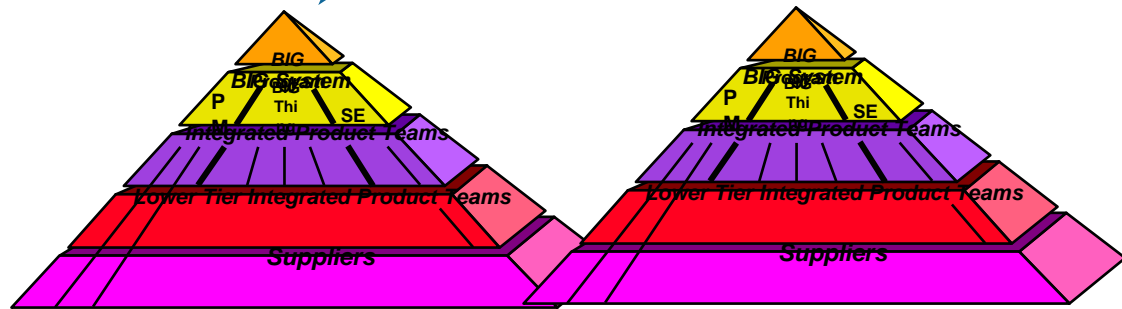


Risk Management – A Critical Enabler for Mission Success

- Understanding opportunities, challenges, and resources
- Setting objectives
- Determining how to reach objectives
- Finding specific opportunities
- Taking steps to turn opportunities into contracts
- Putting people and infrastructure into place to respond to contracts (turning plans into actions)
- Performing the work; giving the customer what it has asked for
- Taking action to ensure all deliverables are provided and accepted and that all contract requirements are formally met

CONTINUOUS RISK MANAGEMENT

Enterprise-Wide Process



- More up front thinking means less work later
- More value-added products produced with reduced effort and time
 - Instead of overrunning budgets and schedules, products are delivered early and on budget
 - Extra deliveries are possible without strain
- Needed less “help” from senior management but got more resources
- Lots of new work pours in
- Communications with other groups is easier



Additional Gains Realized

- Less stress as products are handed off
- Slack added to cost and schedule curves
 - Fewer replan exercises
 - Easier to give back resources
 - Easier to help other projects
- Better understanding of how to get the job done
- Less time doing rework
- No surprises as concerns are addressed earlier in the product life cycle
- Other projects consulting to find out why things were going so well



Summary

- Over the last 30 years, risk management has grown from a distant voice to a major contributor to project success
- Implementation of risk management on projects has proven to increase the quality of products delivered to our customers, as well as to reduce costs and schedule.
- Past presentations encouraged fellow practitioners, customers and suppliers to make risk management an important part of their overall project management process
- Risk management has proven to be limited during program execution due to risks realized earlier in the product life cycle
- Data shows that risk management needs to reach beyond management activities during program execution.
- Mission Assurance, by initiating risk management activities during the early phases of the acquisition live cycle and providing a home for persistent risk management objects, can help program managers avoid many problems that had been found to be common during program execution.

- Senior management to “push back” the consistent and systematic use of risk management to earlier phases of the business acquisition process.
- All proposal teams to look for risks to program execution success
- During the eight phases that precede project contract award, a basic area of involvement for Mission Assurance is to focus on risk management, including using a risk management tool to capture initial risks.
- Mission Assurance to expand its mandate to provide support to each individual program’s success well before program startup.

A Level 5 Organization is Never Satisfied....

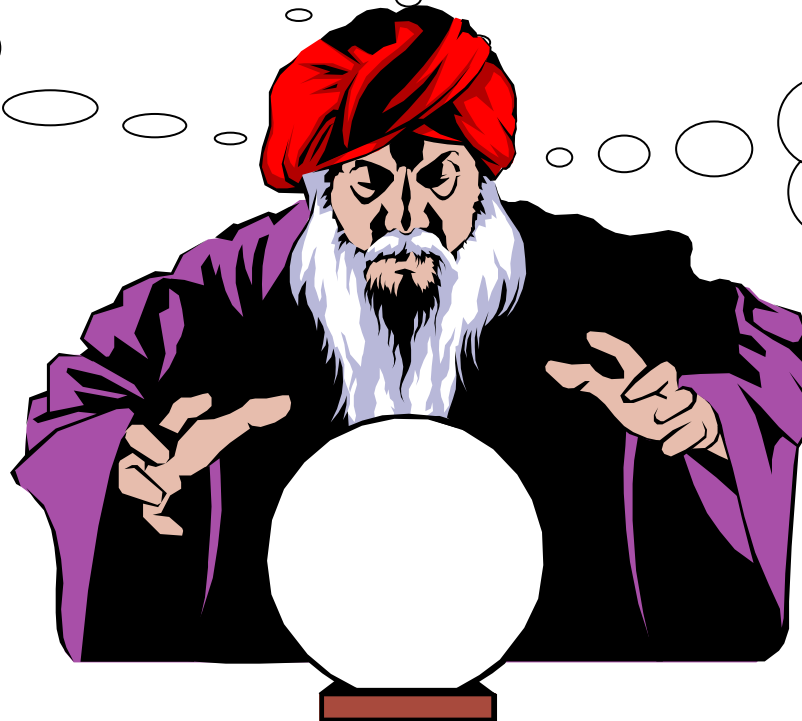
**RiskM and
EVM**

**A family
of RiskM
strategies**

**Better
metrics**

**Opportunity
Management**

**More
efficient
stating**



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