NORTHROP GRUMMAN

DEFINING THE FUTURE

Designing Your Tailoring Approach to Help Achieve Higher Levels of Maturity

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Abstract 1132

Northrop Grumman Mission Systems

- **A leading integrator of complex, mission-enabling systems**

- **2003 Sales - ~$4.1B**

- **18,000 employees in 50 states and in 23 countries**

- **1500 active contracts**

- **Deep, legacy domain expertise in priority, high-growth segments**

- **Premier provider of mission critical end-to-end solutions**

Intercontinental Ballistic Missile Program

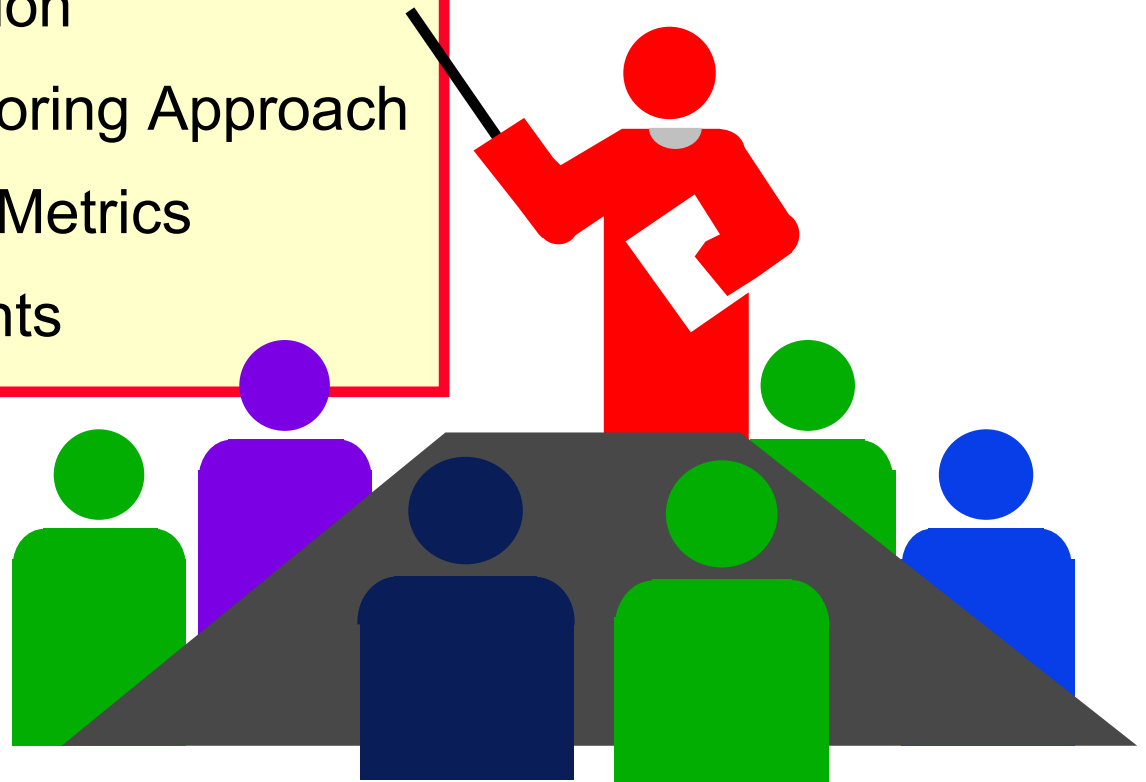**Joint National Integration Center**
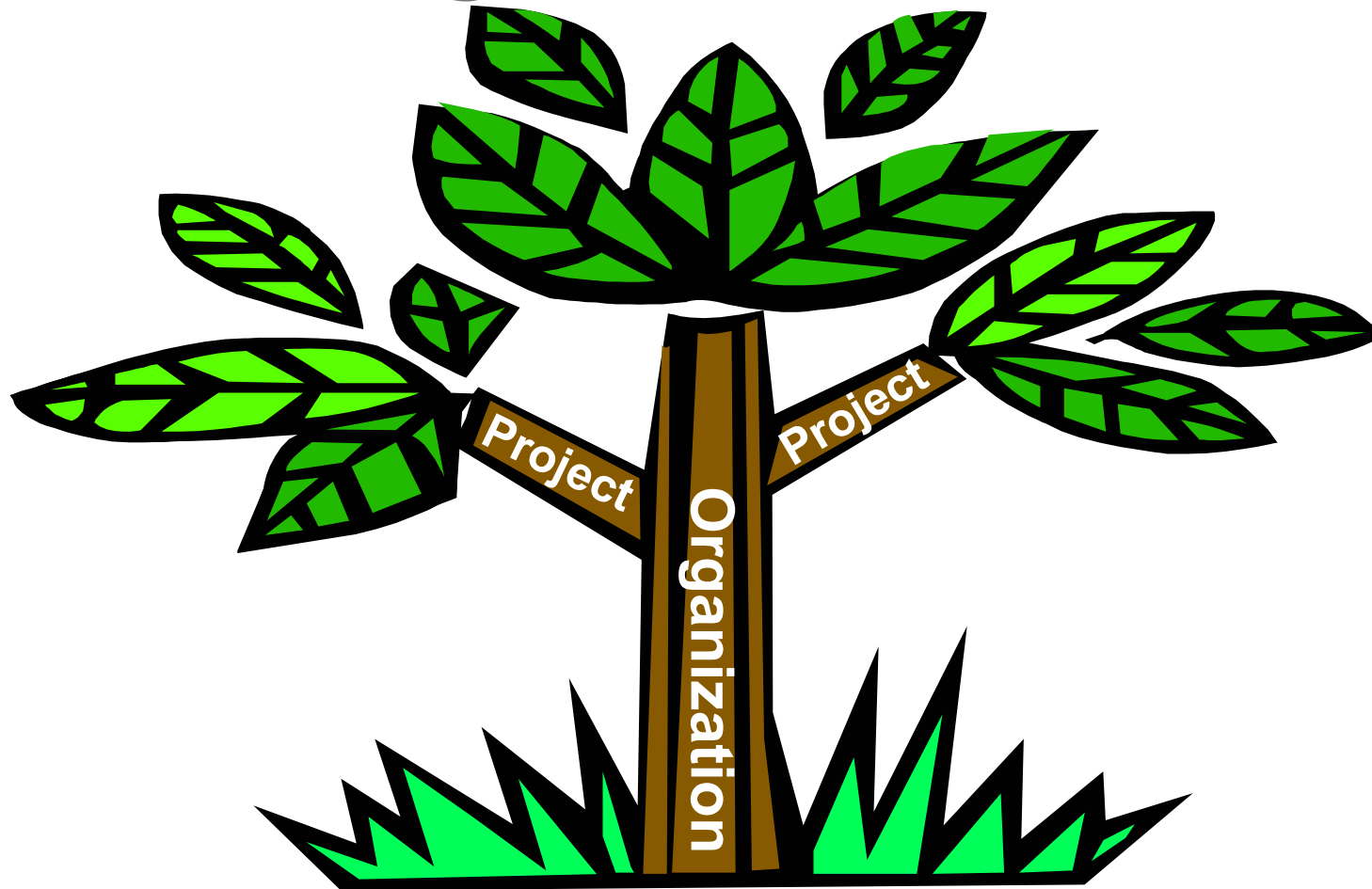
Satellite Command & Control

Focused on program performance

Agenda

- What is Tailoring

- A Typical Organization

- A Mature Organization

- Designing Your Tailoring Approach

- Analyzing Tailoring Metrics
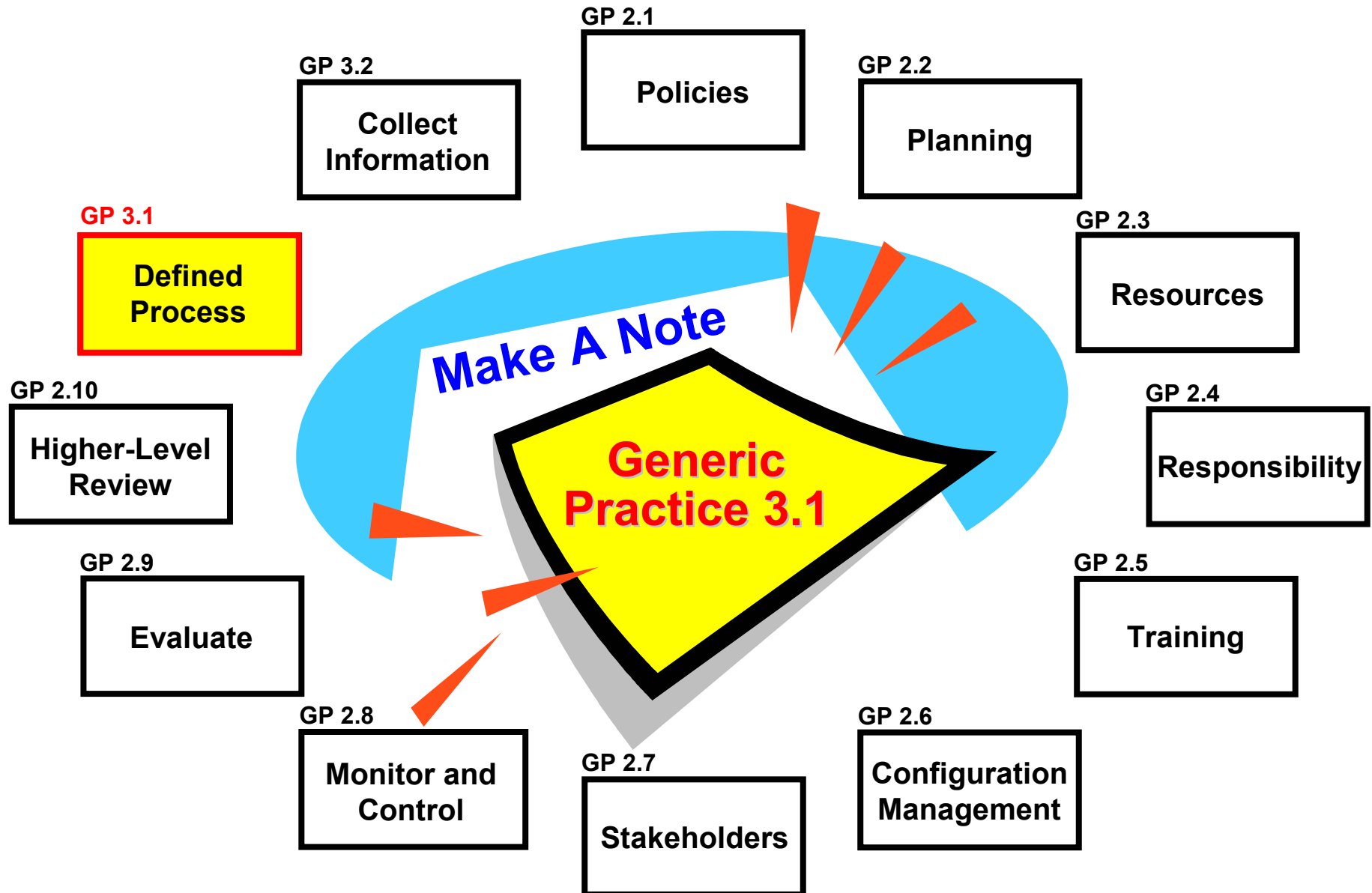
- Making Improvements

What is Tailoring?

Adapt the organization's standard processes to meet the project's objectives to arrive at the project's defined process. Like a family tree, all defined processes must be derived from the same trunk.

Where is Tailoring in the CMMI?

GP 3.1 Establish a Defined Process

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Software Engineering Institute
Pittsburgh, PA 15213-3890

Capability Maturity Model® Integration (CMMI^{SM}), Version 1.1

Tailoring Guidelines

Tailoring a process makes, alters, or adapts the process description for a particular end. For example, a project establishes its defined process by tailoring from the organization's set of standard processes to meet the objectives, constraints, and environment of the project. [FM114.HDA102.HDB120.T101]

"Tailoring guidelines" are used in CMMI models to enable organizations to implement standard processes appropriately in their projects. The organization's set of standard processes is described at a general level that may not be directly usable to perform a process. [FM114.HDA102.HDB120.T102]

Tailoring guidelines aid those who establish the defined processes for projects. Tailoring guidelines cover (1) selecting a standard process, (2) selecting an approved life-cycle model, and (3) tailoring the selected standard process and life-cycle model to fit project needs. Tailoring guidelines describe what can and cannot be modified and identify process components that are candidates for modification. [FM114.HDA102.HDB120.T103]

GP 3.1 Establish a Defined Process

Establish and maintain the description of a defined process.

Subpractices

1. Select from the organization's set of standard processes those processes that cover the process area and best meet the needs of the project or organizational function. [GP114.SubP101]

2. Establish the defined process by tailoring the selected processes according to the organization's tailoring guidelines. [GP114.SubP102]

3. Ensure that the organization's process objectives are appropriately addressed in the defined process. [GP114.SubP103]

4. Document the defined process and the records of the tailoring. [GP114.SubP104]

5. Revise the description of the defined process as necessary. [GP114.SubP106]

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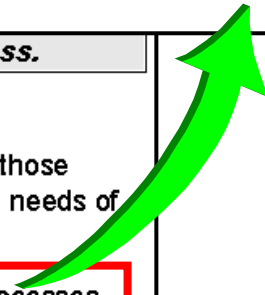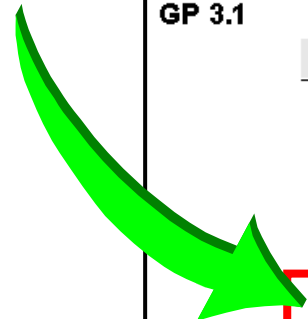
Storyboard of a Typical Organization

1 **Create Standard Processes**

Develop policies and standard processes in Word

2 **Post Standard Processes**

Provide Word files to projects

3 **Go Into Hibernation**

Wait for the next process initiative

4 **Update Years Later**

Update policies and standard processes years later

Storyboard of a Mature Organization

1 **Create Standard Processes**

Develop policies and standard processes in a tool

2 **Post Standard Processes**

Provide the tool to projects

3 **Let the Tool Gather Metrics**

Walk away knowing the tool will automatically gather metrics

4 **Improve Standard Processes**

CMMI Level 5

Use the metrics, to improve the policies and standard processes regularly

Storyboard of a Typical Organization Trying to Become More Mature

1 **Collect Defined Processes**

Collect Word files from projects

2 **Figure Out What Was Tailored**

Analyze red revision bars in every Word file

3 **Waste Resources**

Waste an enormous amount of money and time

4 **Improve Standard Processes**

CMMI Level 5

Use the error-prone metrics, to improve the policies and standard processes regularly

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6 Steps to a Mature Tailoring Approach

1   **Define Goals-Questions-Measures**

2   **Define Tool Requirements**

3   **Define Tailoring Options**

4   **Design Tailoring Tool**

5   **Analyze Metrics**

6   **Improve the Standard Processes**

1 Define Goals-Questions-Measures

Goals	Questions	Measures
• Continually improve the policies • Continually improve the standard processes • Create an efficient tailoring process	• Which policies are being waived? • Which processes are being tailored frequently? • How long is it taking projects to tailor? • Is a particular process troublesome for projects?	• Hours • Number of waivers, deviations, etc. for policies • Number of additions, deletions, etc. for standard processes • Categorize above by project type, project size, etc.
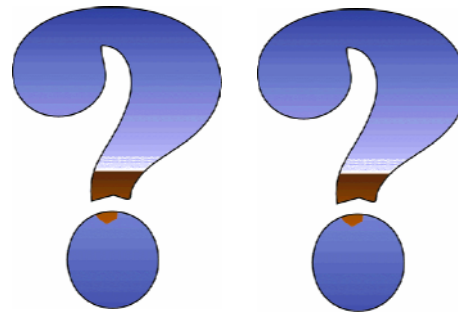
2 Define Tool Requirements

Should the tool generate the defined process?

How will the tool handle updates to the standard processes?

Will the same tool also be used by the organization?

Should we use Excel, Access, Oracle, Web?

Should the tool display by CMMI levels?

Should the tool also be used for audits?
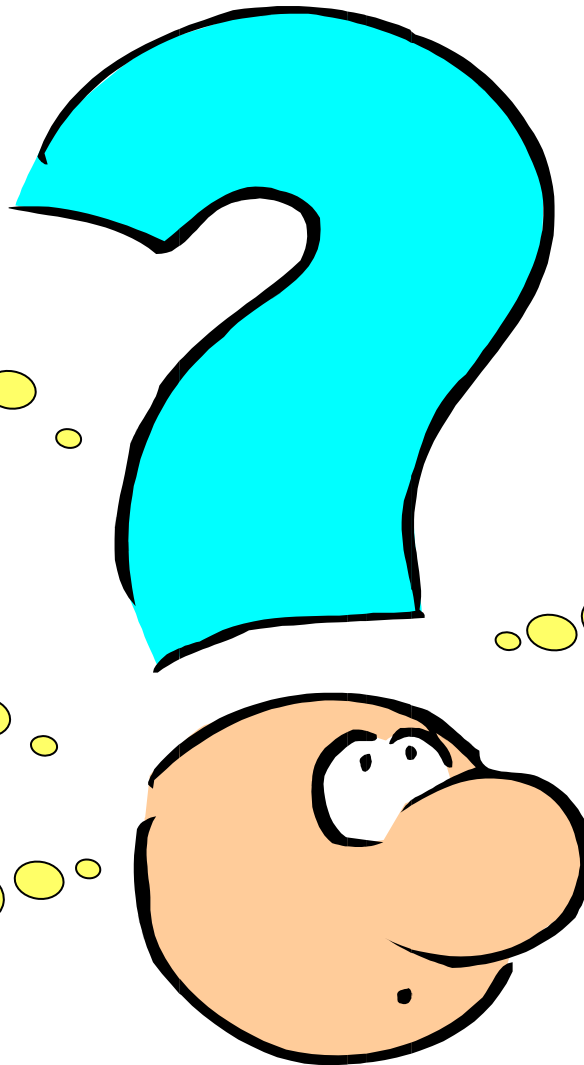
Define Tailoring Options

Policies

- ✓ Compliant
- ✓ Waiver
- ✓ Deviation
- ✓ N/A

Standard Processes

- ✓ Applicable
- ✓ Modify
- ✓ Delete
- ✓ Add
- ✓ N/A

Include detailed definitions of the tailoring options in your Tailoring Guidelines.

4 Design Tailoring Tool

Hours for Defining
Compliance to Policies
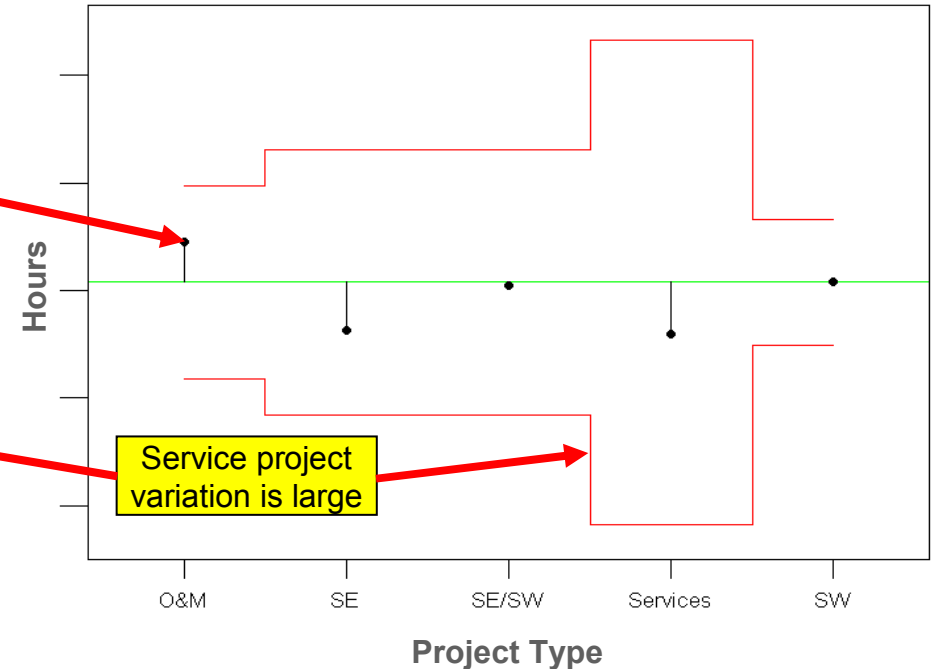
Hours for Tailoring the
Standard Processes

Actions: Improve tailoring guidance and training to reduce variation, especially for service and O&M projects. Publicize good examples.

Analyze Policy Compliance

Project Compliance with Policies

Test for Equal Variance (F-Test)

Project compliance varies more since some projects do not have suppliers

Project compliance varies the most on the policy unique to Mission Systems

921 Project Planning

922 Project Monitoring and Control

923 Supplier Agreement Management

924 Risk Management

925 Quantitative Project Management

926 Project Review Authority

Project Compliance Variance
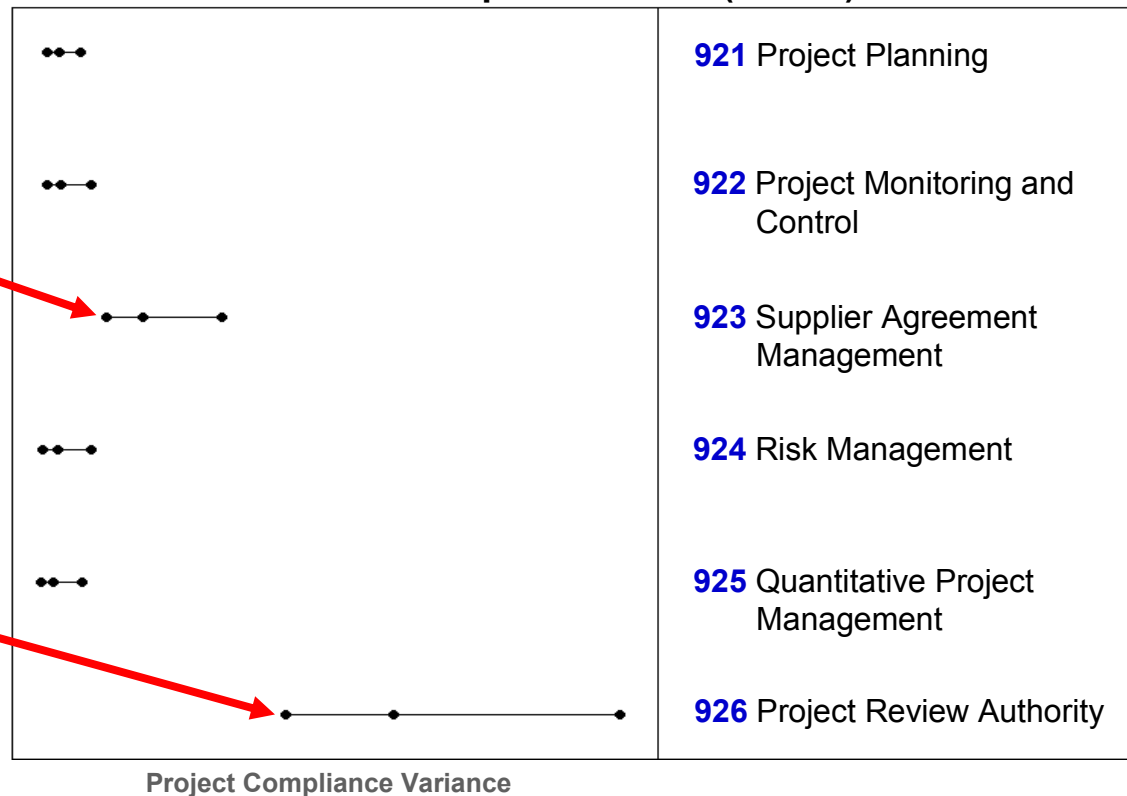
Actions: Improved the list of metrics in 926 Project Review Authority.

Analyze Process Additions
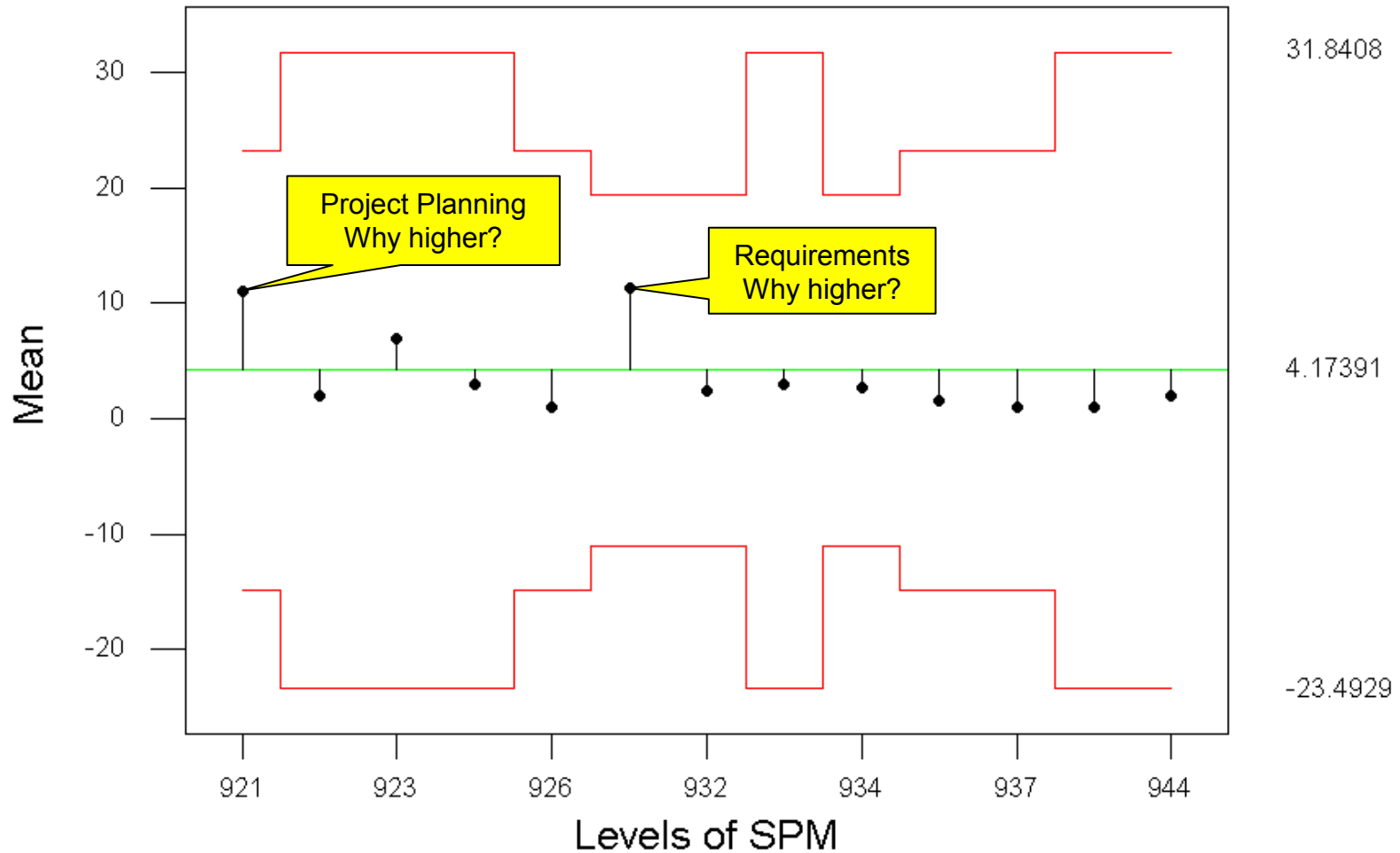
Actions: Identified potential improvements to the processes.

Metrics Available to Projects

This data helps estimate the effort needed to perform tailoring -- helps managers recognize when they need assistance.

Small Projects

Medium Projects

Large Projects

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Improve the Standard Processes
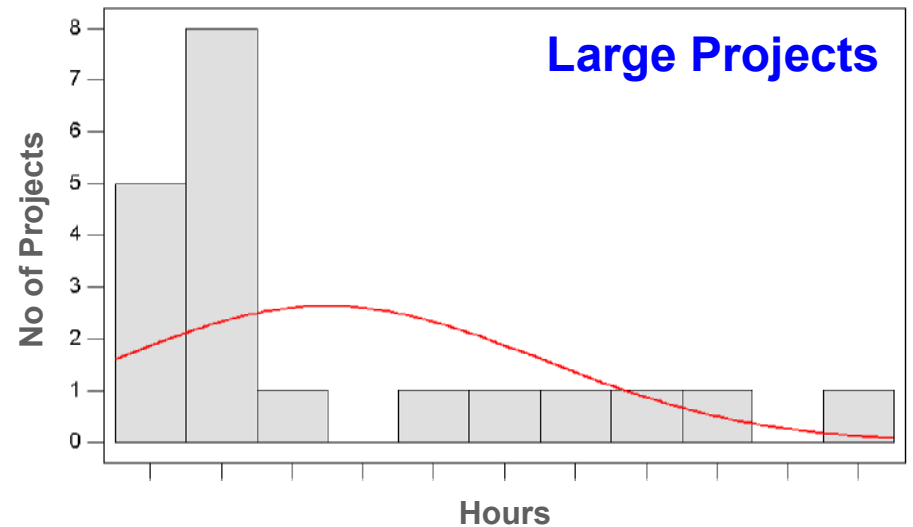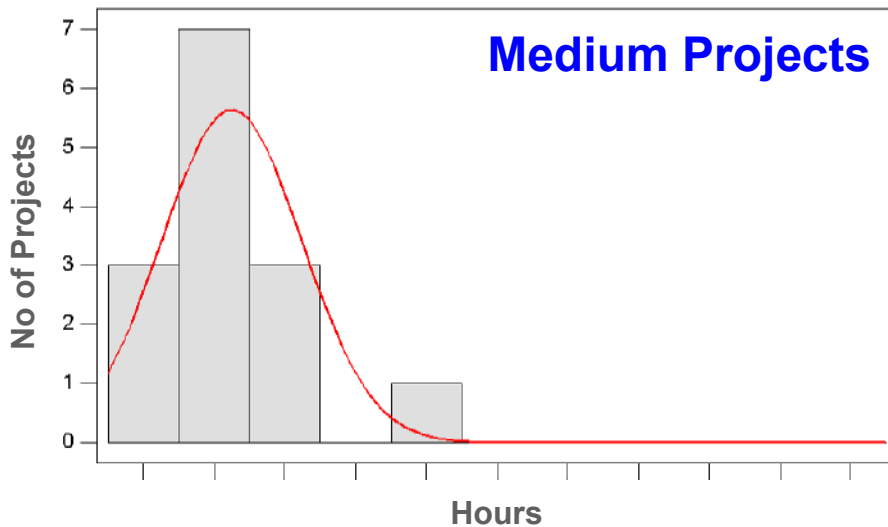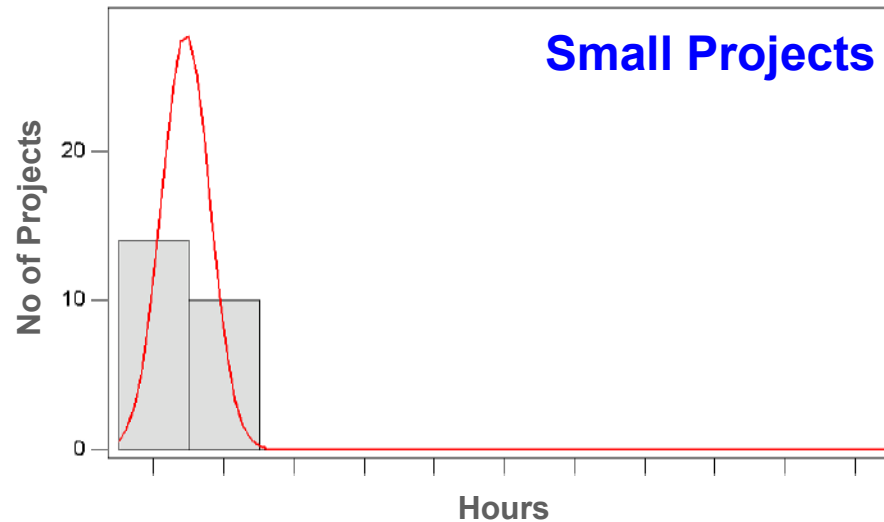
	B	D	E	L Modified	M Deleted	N Not Applicable	
1		SPM					
2							
43	924	4.4.080		1	4		
44	924	4.4.110			4	3	
45	924	4.5.120			4		
46	924	4.5.130			5		
47	924	4.5.140			5		
48	924	4.5.150			5	1	
49	924	4.5.160			7	2	
50	924	4.5.170			5		
51	924	4.5.180			6	2	
52	924	4.5.190			6		
53	924	4.5.200			6	2	
54	924	4.6.050			4		
55	924	4.6.070			4	2	
56	924	4.7.040			4		

	B	D	E	L Modified	M Deleted	N Not Applicable	
1		SPM					
2							
187	934	4.3.130			6	7	
188	934	4.3.150			6	12	
189	934	4.3.180			4	6	
190	934	4.3.190			4	6	
191	934	4.3.230			4	7	

A process step in the Integration (934) standard process was being tailored frequently. After investigating, it was discovered the process step was not what is normally done on projects, i.e., it wasn't "standard" practice. The process step was deleted.

A stretch of process steps in the Risk Management (924) standard process was being tailored frequently. After investigating, it was discovered the process steps were way too detailed and not really "standard" practice. As a result, the standard process was changed to have projects define the details in their project plans.

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Lessons Learned

Top 3 Lessons Learned

Tailoring guidelines and criteria are critical. Provide very specific instructions.

Never assume projects tailored correctly per the tailoring guidelines and criteria.

Consider using the same tool as a policy compliance and process auditing tool.

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Summary

High maturity organizations use quantitative management to improve their process assets