Risk Management Beyond CMMI Level 5

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Background

- There are several straightforward ways to meet the practices of the Risk Management process area.

- Beyond compliance, a Level 5 organization asks “Can the effectiveness and efficiency of the Risk Management process be improved?”

- This presentation examines some of the techniques and opportunities being used by Northrop Grumman to build on the CMMI Risk Management practices.
Agenda

A Quick Review of Risk Management Practices in the CMMI

Risk Management – What’s Important to Improve?

The Journey Ahead – More Opportunities for Process Improvement
Review - Risk Management in the CMMI

**SG 1 Prepare for Risk Management**
Preparation for risk management is conducted.

**SP 1.1 Determine Risk Sources and Categories**
Determine risk sources and categories.

**SP 1.2 Define Risk Parameters**
Define the parameters used to analyze and categorize risks, and the parameters used to control the risk management effort.

**SP 1.3 Establish a Risk Management Strategy**
Establish and maintain the strategy to be used for risk management.

**SG 2 Identify and Analyze Risks**
Risks are identified and analyzed to determine their relative importance.

**SP 2.1 Identify Risks**
Identify and document the risks.

**SP 2.2 Evaluate, Categorize, and Prioritize Risks**
Evaluate and categorize each identified risk using the defined risk categories and parameters, and determine its relative priority.

**SG 3 Mitigate Risks**
Risks are handled and mitigated, where appropriate, to reduce adverse impacts on achieving objectives.

**SP 3.1 Develop Risk Mitigation Plans**
Develop a risk mitigation plan for the most important risks to the project as defined by the risk management strategy.

**SP 3.2 Implement Risk Mitigation Plans**
Monitor the status of each risk periodically and implement the risk mitigation plan as appropriate.
Process Compliance is Not Enough

- A compliant process may not be efficient, nor effective, nor sufficient to meet the customers’ needs
- A competitive environment requires a proactive approach to improving all processes

What do we expect to happen in a Level 5 organization?

- Institutionalization
  - All projects implement Risk Management

- A process improvement focus
  - Every practitioner is looking for ways to make the risk management process better

- A data-driven culture
  - Data is gathered about the risk management process to identify ways it can be improved
Risk Management is a Decision Management Tool

Decisions With Respect to Level of Knowledge

Uncertainty (Probabilities)

- More Uncertainty
  - Choosing between emerging technologies

- Some Uncertainty
  - Selecting an architecture

- Certainty / Near Certainty
  - Deciding on best COTS to meet requirements

Certainty ("Perfect" Information)

Many decisions fit somewhere in the middle where uncertainty can be “managed”
Where Can We Look for Improvements?

**Lean Six Sigma, applied to Risk Management**

- **Voice of Customer**
  - Who are the customers of the risk management process?
  - What do they need? Desire? How do they judge success?

- **Voice of Process**
  - How efficient is our process? (e.g., risks identified/managed per resources spent)
  - How effective is our process? (e.g., identifying all risks)
  - Is there any unnecessary variation?
  - Are there any bottlenecks or time-wasters?
  - Can we reduce defects? (e.g., unidentified risks)

- **Voice of Business**
  - What best-practices exist in the community?
  - What will our future needs be?
## SIPOC Process Map - Project-Level Risk Management

<table>
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<tr>
<th>Suppliers</th>
<th>Inputs</th>
<th>Process</th>
<th>Outputs</th>
<th>Customers</th>
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<tr>
<td>Process Group</td>
<td>Historic risks</td>
<td>Determine risk sources and categories</td>
<td>Risk sources, categories, parameters</td>
<td>Risk identifiers (project personnel)</td>
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<td></td>
<td>Organizational guidance</td>
<td>Define risk parameters</td>
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<td>External Customer</td>
<td>Areas of concern</td>
<td>Determine risk strategy</td>
<td>Risk strategy</td>
<td>Project Risk Manager</td>
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<td>Identify risks</td>
<td>Identified risks</td>
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<tr>
<td>Project personnel</td>
<td>Areas of concern</td>
<td>Evaluate, categorize, and prioritize risks</td>
<td>Prioritized risks</td>
<td>Project personnel</td>
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<tr>
<td>Project Risk Manager</td>
<td>Expertise, experience</td>
<td>Develop risk mitigation plans</td>
<td>Risk mitigation plans</td>
<td>Project Risk Manager</td>
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<td>Implement risk mitigation plans</td>
<td>Lessons learned Metrics</td>
<td>Process Group</td>
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<td>Adherence to plans</td>
<td>Customer</td>
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## Risk Management Improvement Opportunities (1 of 2)

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<th>Goal/Practices</th>
<th>Improvement Opportunities</th>
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<td>▪ More useful sources  &lt;br&gt; ▪ More useful categories</td>
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<td>▪ More insightful parameters</td>
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<td><strong>SP 1.3 Establish a Risk Management Strategy</strong>  &lt;br&gt; Establish and maintain the strategy to be used for risk management.</td>
<td>▪ More effective strategies  &lt;br&gt; ▪ Tailorable strategies</td>
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## Risk Management Improvement Opportunities (2 of 2)

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| **SG 2 Identify and Analyze Risks**  
Risks are identified and analyzed to determine their relative importance. |  |
| **SP 2.1 Identify Risks**  
Identify and document the risks. | ▪ More efficient identification  
▪ Few risks not identified |
| **SP 2.2 Evaluate, Categorize, and Prioritize Risks**  
Evaluate and categorize each identified risk using the defined risk categories and parameters, and determine its relative priority. | ▪ More efficient evaluation, categorization, prioritization  
▪ Fewer risks mis-evaluated, mis-categorized, mis-prioritized |
| **SG 3 Mitigate Risks**  
Risks are handled and mitigated, where appropriate, to reduce adverse impacts on achieving objectives. |  |
| **SP 3.1 Develop Risk Mitigation Plans**  
Develop a risk mitigation plan for the most important risks to the project as defined by the risk management strategy. | ▪ More efficient planning  
▪ More effecting planning |
| **SP 3.2 Implement Risk Mitigation Plans**  
Monitor the status of each risk periodically and implement the risk mitigation plan as appropriate. | ▪ More efficient monitoring  
▪ More effective monitoring |
Voice of Customer – Project Managers’ Top Concerns

- More consistent risk identification, to reduce the number of unidentified risks
- Better integration across teams and management levels
- Better process tailoring to fit project size and risk level

Managers and employees are not knowledgeable in, and/or do not effectively use Risk Management
Risks Must be Rolled Up Throughout the Entire Stakeholder Pyramid Vertically

Risks are reassessed as they are rolled up to each level based on impact at that level.
Better Integration Across Teams And Management Levels

Corporate

Sector

Sector

Sector

Division

Division

Division

Operations

Operations

Operations

Program

Program

Program

Project

Project

Project

IPT

IPT

IPT

Process, Resources

Elevated Risks
“Small Risks” Can Lead to Program Failure

Risky areas in our product realization processes provide opportunities for potential failure modes to be created and propagate causing failure.
Mission Success Requires Multiple Approaches

- Risk Management
- Systems Engineering
- Independent Reviews
- Training, Tools, & Templates
- CMMI Level 5 for Software, Systems, and Services
- ISO 9001 and AS-9100 Certification
- Six Sigma
- Dashboards for Enterprise-Wide Measurement
- Communications & Best-Practice Sharing
- Robust Governance Model (Policies, Processes, Procedures)
A Level 5 Organization is Never Satisfied….

- RM and EVM
- A family of RM strategies
- Better metrics
- More efficient statusing

Opportunity Management