

On Lock Down: Requirements Change Management

BAWORLD WINNIPEG, MB, October 7th - 9th, 2015

Hans Eckman | HansEckman.com

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How can we help you shine?



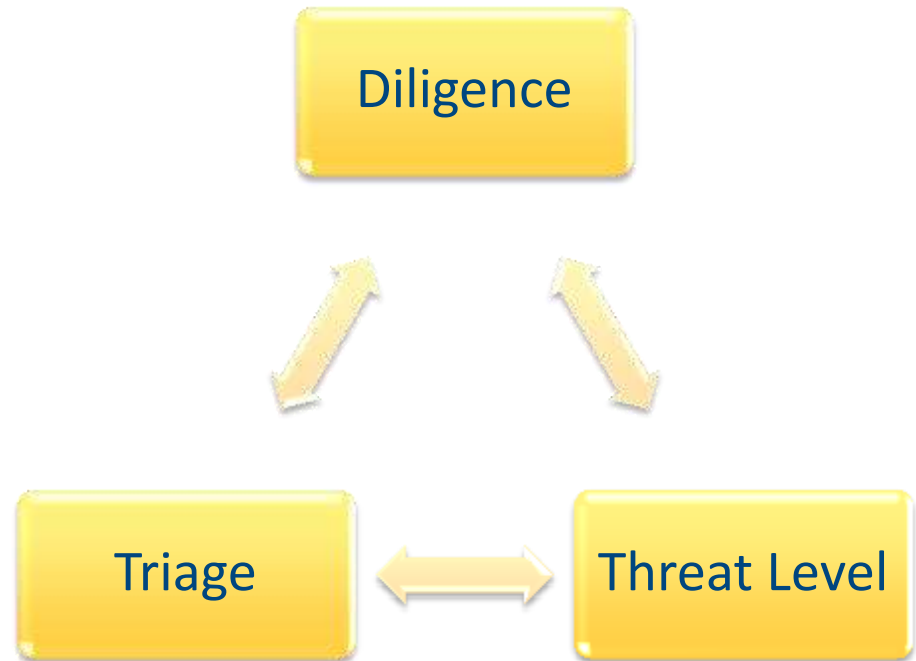
Ground Rules

- This session is for you, so please participate.
- Interrupt me for clarifications.
- The content in this presentation is the responsibility of Hans Eckman, and does not express the views or opinions of SunTrust Bank.
- No animals were harmed during the creation of this presentation. Please support your local pet rescue groups.



Conclusions

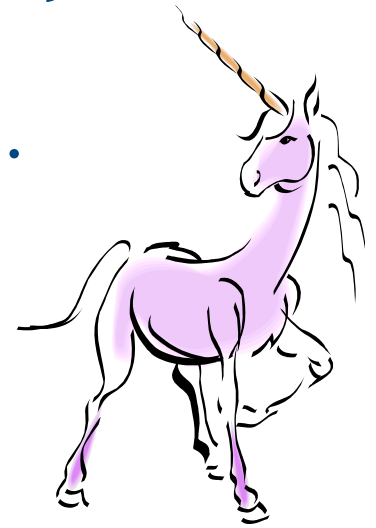
- Principles of release management and change control can be applied to requirements management.
- Level of control must match risk and timing.
- Consistency and diligence are required for success.



The Ideal Project Timeline



- All stakeholders agree, and know exactly what they need from the beginning.
- Developers translate the requirements perfectly into a viable solution.
- No defects or missed requirements in solution.
- No change in business need or prioritization during the project.



The High Cost of Change

Error Cost Factor	Requirements, Design	Coding, Unit Test	Integration Test	Acceptance Test	Post-product Release
Tassey ¹	1x	5x	10x	15x	30x
Boehm ^{2,3}	1x	3x	7x	50x	100x
When Errors are introduced ¹	3.5%	10.5%	35%	6%	15%

Other Cost Factors³

- “One insight shows the cost-escalation factor for small, noncritical software systems to be more like 5:1 than 100:1.”
- “Current software projects spend about 40 to 50 percent of their effort on avoidable rework.”
- “Two major sources of avoidable rework involve hastily specified requirements and nominal-case design and development...”

The Only Constant is Change



Ambiguities, Clarifications, Invalid Requirements

Scope and Prioritization Changes

Constraints: Design, Resource, Time, Budget

Missed Requirements

Missed implementation

Change in business need

Threat Levels

No Material Impact:

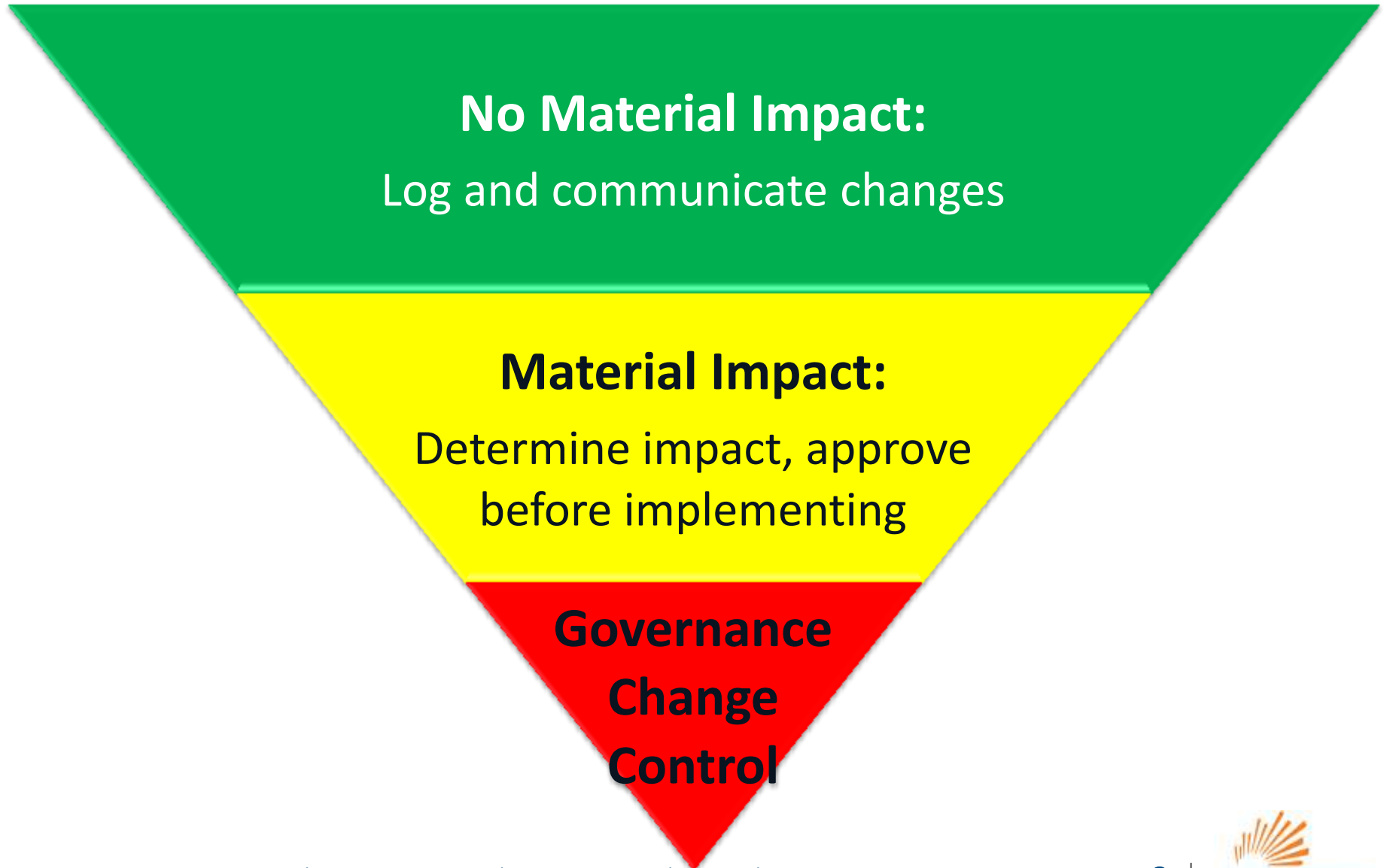
Typos, Wording Ambiguities, Clarifications, Structure, Formatting, Decomposition, Supporting Requirements, Details, Etc.

Material Impact:

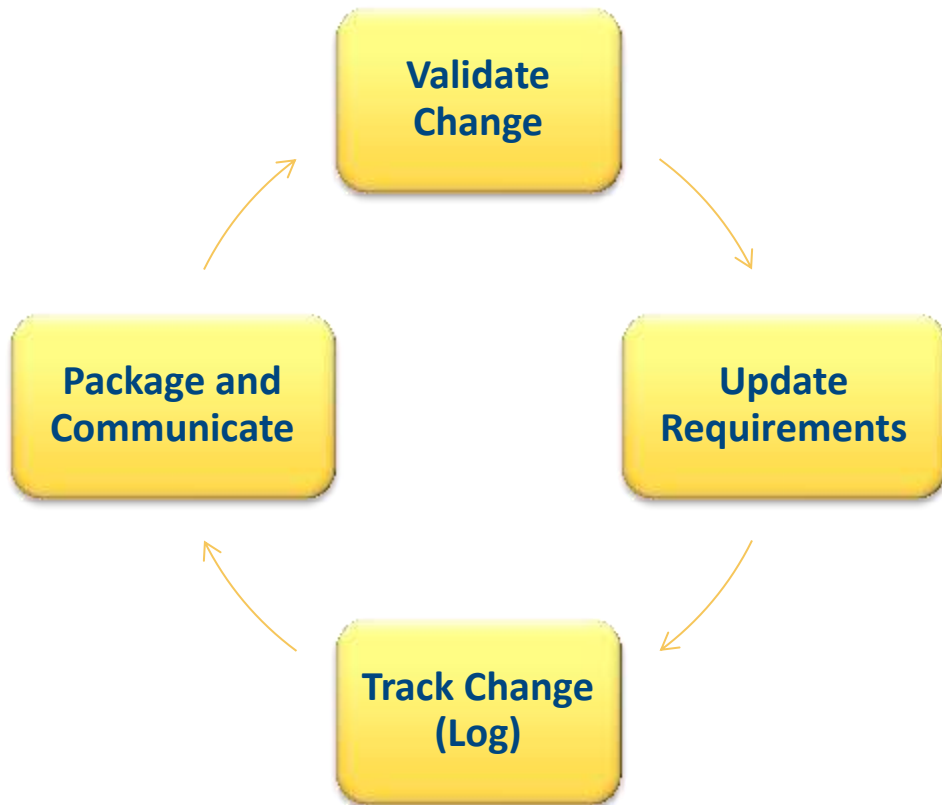
Missed Requirements, New Requirements, Constraints, External Impacts, Etc.

Governance Impact

Triage Levels



No Material Impact - Update Process



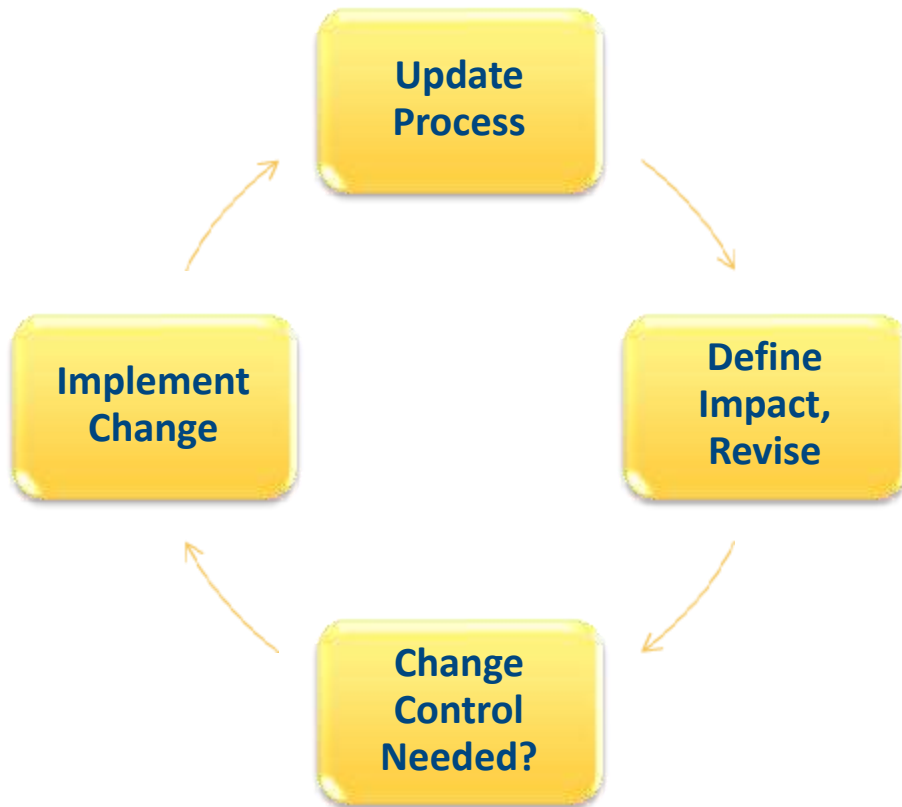
- Begin after first formal communication of requirements
- Need to update system of record for requirements
- Log all changes with effective date
- Update Process is the foundation for Change Approvals

Documenting Changes

1.08	Eckman	<p>Correction to field value found during testing.</p> <p>UPDATE: 5.139.09.02 ID 5.139.09.02 - [blurred text]</p> <p>TO: 5.139.09.02 ID 5.139.09.02 - [blurred text]</p> <p>UPDATE: 5.142.09.02 ID 5.142.09.02 - [blurred text]</p> <p>TO: 5.142.09.02 ID 5.142.09.02 - [blurred text]</p>	11-24-2008
1.08	Eckman	<p>DefectID: 27246</p> <p>UPDATED: 5.06.04.01 ID 5.06.04.01 - [blurred text]</p> <p>5.06.08.01 ID 5.06.08.01 - [blurred text]</p>	12-01-2008

- Changes are logged by document version
- State changes source: defect, change control, etc.
- Identify owner, effective date and requirement ID
- Show before and after

Changes Requiring Approval



- Occurs when:
 - After document approval
 - Change to functionality
 - Impacts other deliverables
 - Impacts cost or schedule
- Leverages Update Process
- Define impact and cost if change is implemented
- Complete Governance
Change Control if needed
- Stakeholders must approve

Tracking Approvals

The screenshot displays a Microsoft Excel spreadsheet titled "PVIC_PREIS0048_Change_Control_Log.xls (Compatibility Model) - Microsoft Excel". The spreadsheet contains a table with the following columns: Change Control, Date Identified, Change, Reason, Status, Hours, Contact, Targeted Release, Reviewed, Approved, Dev. Target, Dev. Complet, and Verified. The data rows show various change control entries, including those with status "Approved" and "Rejected".

Change Control	Date Identified	Change	Reason	Status	Hours	Contact	Targeted Release	Reviewed	Approved	Dev. Target	Dev. Complet	Verified
PVIC_PREIS0048_Change_Control_83	02/25/2009		Production Support 2447	Approved	1.0		2009.1.HL1	02/26/2009	02/26/2009	02/26/2009	02/26/2009	02/26/2009
PVIC_PREIS0048_Change_Control_84	02/25/2009		Production Support 2448	Approved	1.0		2009.1.HL1	02/26/2009	02/26/2009	02/26/2009		03/08/2009
PVIC_PREIS0048_Change_Control_85	02/25/2009		Production Support 2449	Approved	1.0		2009.1.HL1	02/26/2009	02/26/2009	02/26/2009		03/08/2009
PVIC_PREIS0048_Change_Control_86	02/25/2009		Production Support 2454	Approved	1.0		2009.1.HL1	02/26/2009	02/26/2009	02/26/2009		03/08/2009
PVIC_PREIS0048_Change_Control_87	02/25/2009		Production Support 2443	Rejected	2.0		2009.1.HL1	02/27/2009	NO			
PVIC_PREIS0048_Change_Control_88	02/25/2009		Production Support 2443	Rejected	2.0		2009.1.HL1	02/27/2009	NO			

An inset window titled "Change Control Details" provides a detailed view of a specific change control entry, showing the "Reason" column with a detailed description of the change and its impact.

Governance Change Controls

SUNTRUST CHANGE CONTROL FORM

CHECK SPELLING

Project Information

Program/Project Name:		Project Number:	
Project Manager:		Current Project Level:	
Technology Workstream:		Commodity:	
Workstream Owner:		Commodity Executive:	
Project Business Owner:		Commodity Owner:	
Current Governance Phase:		Contract Spend:	
Change Control Number:		Date Form Completed:	
Project Repository Path:			

Change Request Information

Change Type: Scope/Requirement Schedule Cost Other:
 Resource Architecture/Technology Notification Only (e.g., Governance)

Description of change:

Justification/Reason for the change:

Implications of not making the change:

Risk Impact of the change:

Impact to Business Case:

Scope/Requirement Change Details

Scope/Requirement Impact:

Deliverables Impacted:

External Implications:

Schedule Change Details - for Current Governance Phase

Schedule Impact:

Release Change (Technology Projects Only)	Current Release		New Release	
	Baseline		Forecast	
	Start	End	Start	End
Governance Phase/Activity Name				

Cost Change Details - for Current Governance Phase

Cost Impact:

Change in Project Level	Current Level:	Forecast Level	Cost Variance
Cost Category	Funding Source/Year	Baseline Cost	Forecast Cost
			0.00
			0.00

Instructions Change Control Form

Additional step in Approval Process

Follow standard change control form and process

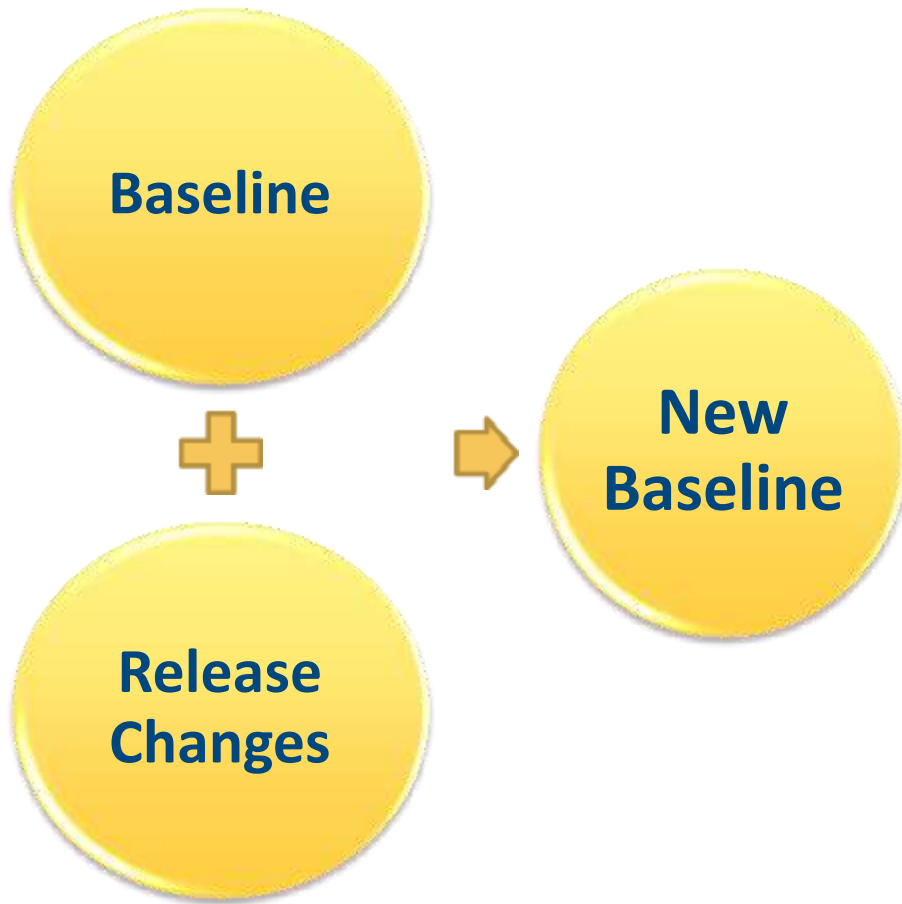
Use for

- Changes after artifact signoff
- Significant project impacts (scope, functionality, cost, schedule, etc.)
- Regrouping scope into releases or implementations
- Approval of all changes for final document version

Best Practices

- Communicate change process and templates as part of your requirements approach. No Surprises!
- Maintain consistent control and communication.
- Impact assessment is key to risk management.
- Leverage tools when available
 - Requirements management system
 - Defect/Change log
 - Track changes (Microsoft Word)
- Cross-reference every change
 - Source
 - Reason
 - Date
 - Supporting documentation: defect, change request, impact analysis, change control, etc.

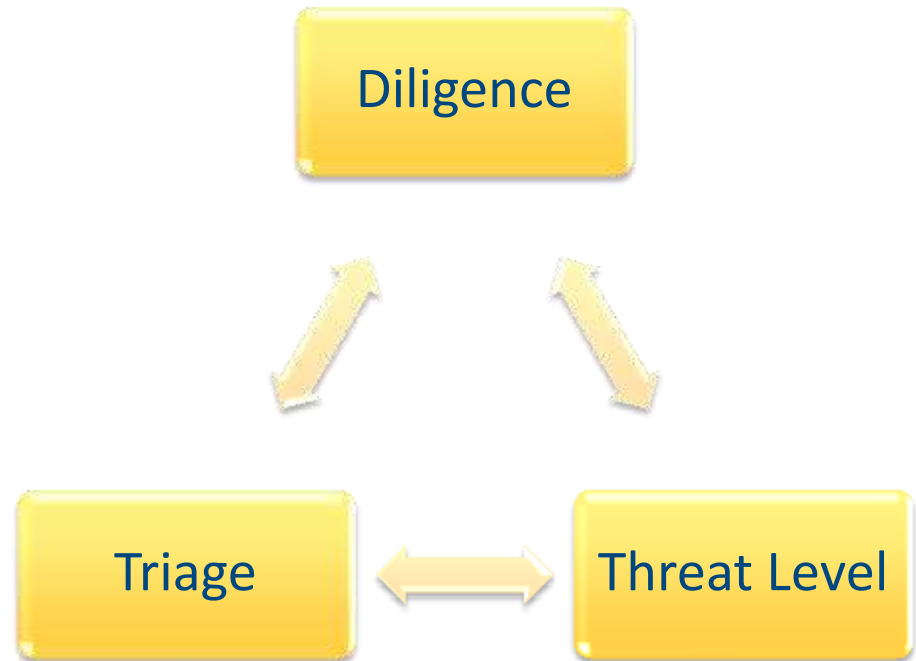
Applying to Baseline Documentation



- Starting from baseline documentation dramatically reduces cost and risk
- Treat all scope as changes to baseline requirements
- Sum of changes is the release scope
- Sum of changes and original baseline becomes the new baseline
- May take additional time and effort to maintain accurate baseline

Conclusions

- Principles of release management and change controls can be applied to requirements management.
- Level of control must match the risk and timing.
- Consistency and diligence are required for success.



Appendix: Cost of Changes and Defects

1. *The Economic Impacts of Inadequate Infrastructure for Software Testing*

- <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.3316&rep=rep1&type=pdf>
- Gregory Tassej, Ph.D., National Institute of Standards and Technology
- Prepared by RTI: Health, Social, and Economics Research, RTI Project Number 7007.011

2. *Requirements-Based Testing: Encourage Collaboration Through Traceability*

- <http://www.softwaremag.com/linkservid/0E91E962-AEE3-2E9A-B2B475D66F29CC30/showMeta/0/>
- MKS, 2009

3. *Software Defect Reduction Top 10 List*

- <http://www.cs.umd.edu/projects/SoftEng/ESEG/papers/82.78.pdf>
- Barry Boehm and Victor R. Basili, January 2001

4. *An Introduction to Agile Software Development*

- http://www.danube.com/docs/Intro_to_Agile.pdf
- Victor Szalvay, Danube Technologies, Inc., November 2004

5. *Cost of Change - Modernized*

- <http://www.aptprocess.com/whitepapers/CostOfChangeModernised.pdf>
- Paul Oldfield, Mentors, 2003, Appropriate Process Group

About SunTrust Banks, Inc.

SunTrust Banks, Inc., with total assets of \$189 billion as of June 30, 2015, is one of the nation's largest and strongest financial holding companies.

Through its banking subsidiaries, the company provides deposit, credit, trust, and investment services to a broad range of retail, business, and institutional clients. Other subsidiaries provide mortgage banking, brokerage, investment management, equipment leasing, and capital market services. Atlanta-based SunTrust enjoys leading market positions in some of the highest growth markets in the United States and also serves clients in selected markets nationally.

The company operates approximately 1,425 retail branches and 2,150 ATMs in Alabama, Arkansas, Florida, Georgia, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, and the District of Columbia. In addition, SunTrust provides customers with a full range of technology-based banking channels, including Internet, PC, and Automated Telephone Banking.

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- Hans Eckman - HansEckman.com
 - Hans@HansEckman.com or hans.eckman@suntrust.com
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