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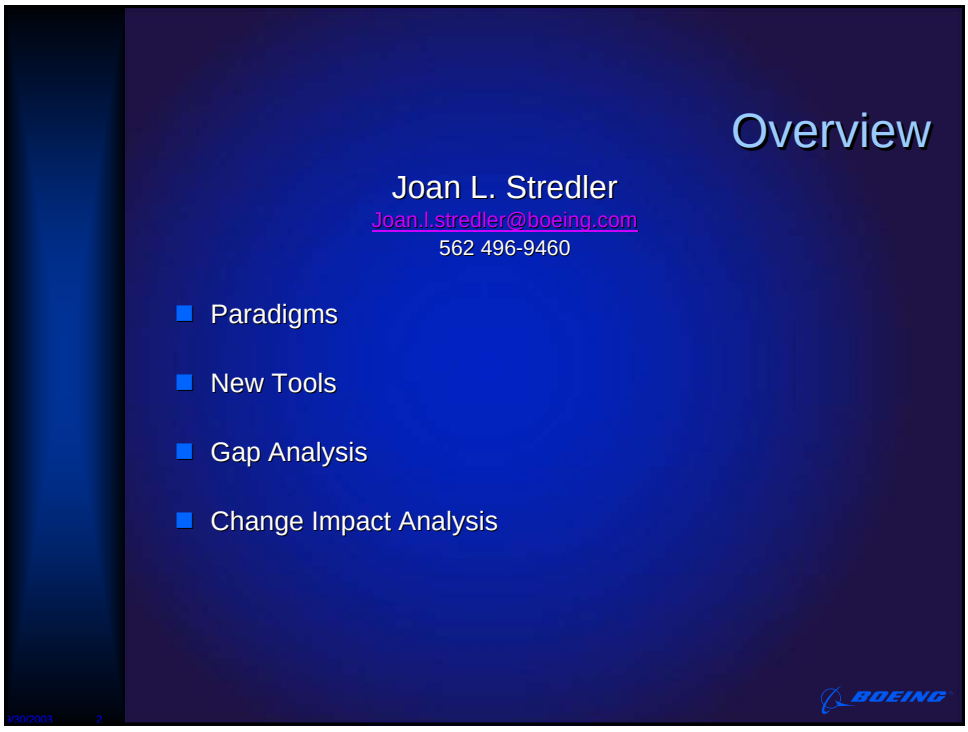

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Responsibility Paradigms

- **Military**
  - Deliberately changing hierarchy

- **Commercial**
  - More consistent distributed network

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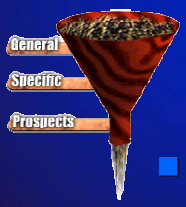
Standards Paradigm

DO-178B

- Mature Guidance

- Constant training available
- Constant refinement of interpretation
- Supporting Tools
- Practical approach
  - Increasing levels of rigor



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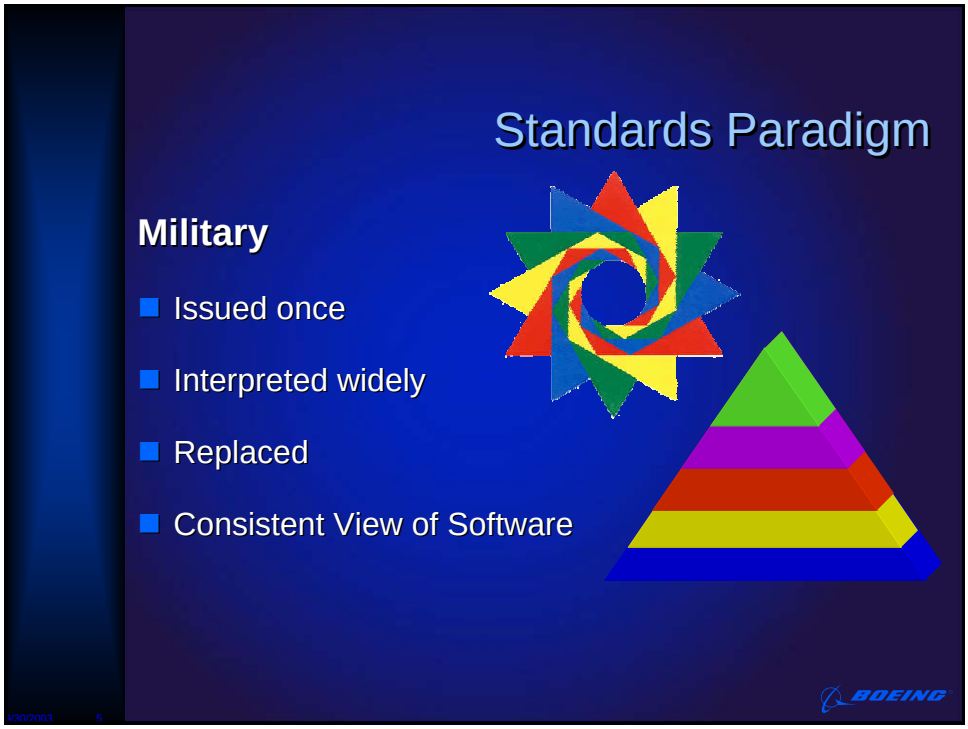

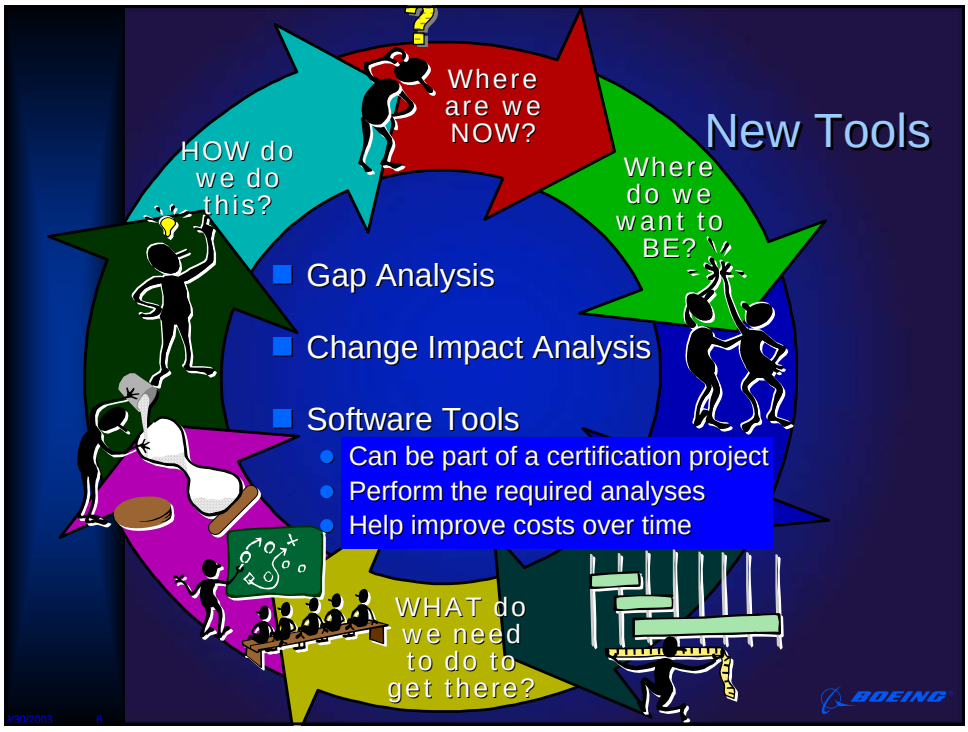

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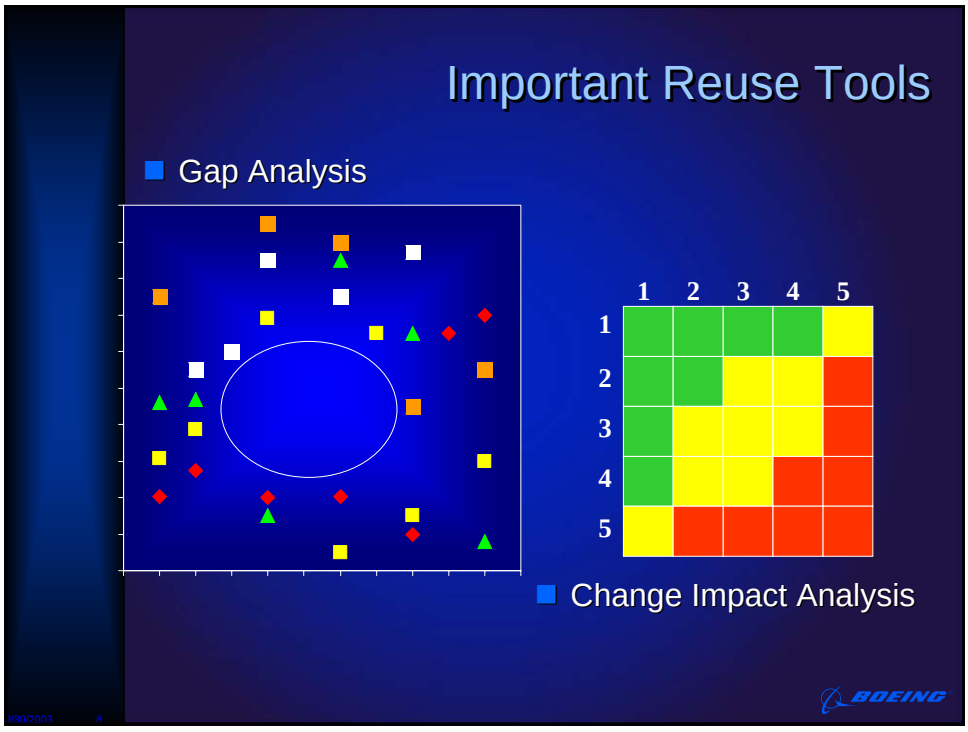

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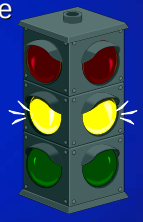
Gap Analysis — Benefits

- Helps create uniformity
  - Compare Military Standard implementation to guidance of DO-178B
- May reveal safety risks
- Provides evaluation information for deciding where to apply resources
- Provides context for using alternate means of compliance (e.g. Service history)



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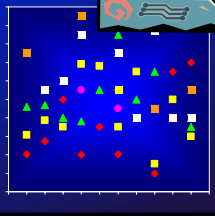
Gap Analysis — Method

- Analysis and evaluation of the artifacts that represent the proposed reused code
- Documentation of the data and findings
- Realistic proposal for eliminating the gap



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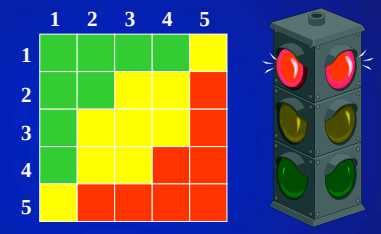
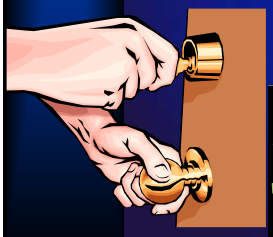
Gap Analysis — Results

Data that allows comparison across software systems that can:

- Reveal risks





- Aid in evaluating suppliers
- Form the basis for improving function and safety

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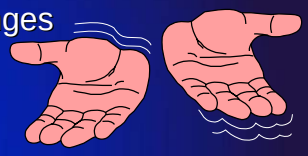
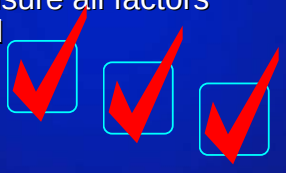
Change Impact Analysis — Benefits

- Innovative way to evaluate changes



- Checklist to ensure all factors are considered



- Consistent basis for determining extent of regression testing

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Change Impact Analysis — Method

- Develop template
- Utilize FAA report on CIA (Rierson)
- Develop checklist

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Change Impact Analysis — Results

- Uniform method for regression test suite analysis
- Developer acceptance-enhancement
- Consistency, repeatability

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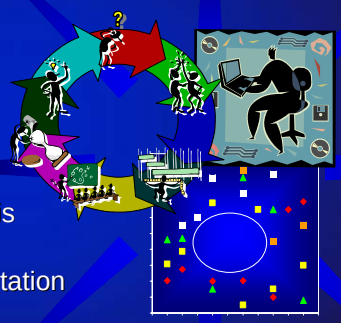
Summary

- Many Benefits
- New Tools
- Gap Analysis
- Change Impact Analysis
- Challenge Is Implementation



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System Software Change Impact Analysis Template

NOTE: ***Systems and software change impact analysis will be conducted by the Avionics System Engineering and Software Development Group, respectively. The procedural activities needed to verify the potential impact of the software changes on a system are de***

LRU:			
SECTION	**TASK**	**TASK DESCRIPTION**	**TASK OBJECTIVES**
A	**System or Software change description**	**Describe functional change(s)**	Provide brief description the intended purpose of the system/software change and overall functionality
RESULT			
B_1	**System change impact assessment**	**Perform treacibility analysis for:** 1. Sys Interfaces/Functions 2. Sys Tests 3. Sys Documentation	Perform traceability analysis to assess the affect of S/W changes on the following items: 1. Function description; % of total functions changed 2. Identify: impacted tests; new tests; deleted tests 3. Identify: changed documents; new documents
B_2	**Software change impact assessment**	**Perform treacibility analysis for:** 1. Software Modules 2. Software Tests 3. Software Documentation	Perform traceability analysis to assess the affect of S/W changes on the following items: 1. Module description; % of total code changed 2. Identify: impacted tests; new tests; deleted tests 3. Identify: changed documents; new documents
RESULT			
C	**Previously developed S/W assessment**	**Perform :** 1. Gap Analysis 2. Impact on criticality analysis 3. Legacy system upgrade	1. Perform analysis with respect to existing documentation and processes 2. Assess impact on criticality analysis 3. Upgrade legacy system processes if required
RESULT			
D	**Operational safety impact**	**Perform operational safety analysis based on:** 1. Safety related analysis 2. Timing & memory utilization 3. Warning or alerts 4. Process or development environment/support tools 5. Requirements 6. Design 7. Data coupling 8. Control coupling 9. Part	Assess S/W change impact on the operational safety of the A/C based on the following information: 1. Assess impact on safety criticality (FHA, SSA) 2. Estimate impact on timing, memory and utilization 3. Identify number of warnings & alerts impacted 4. I

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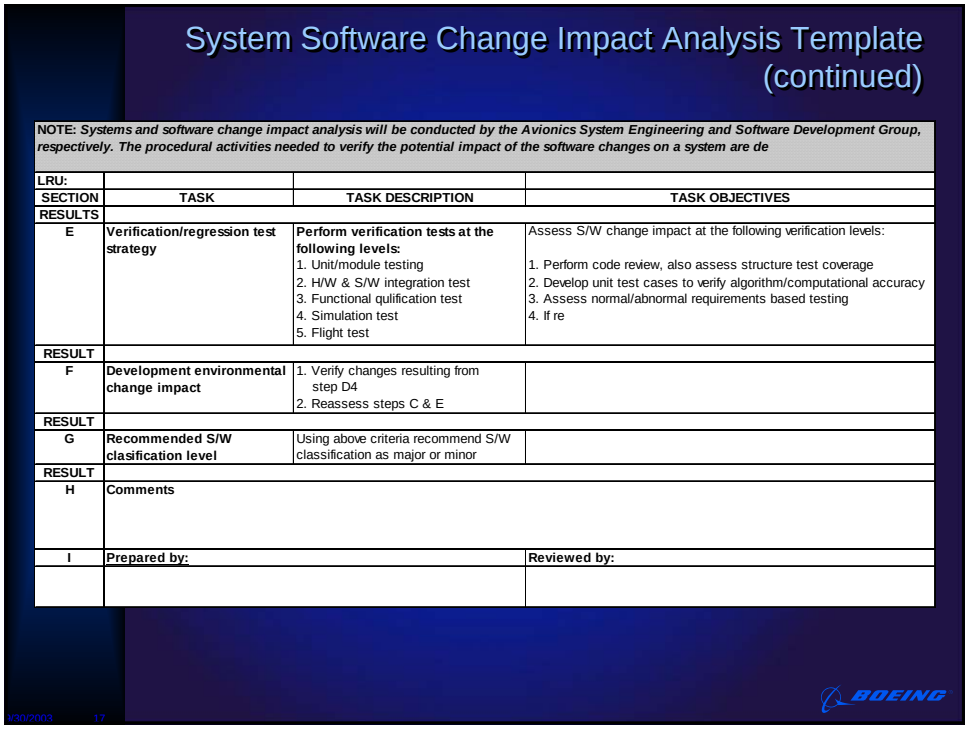

System Software Change Impact Analysis Template (continued)

NOTE: *Systems and software change impact analysis will be conducted by the Avionics System Engineering and Software Development Group, respectively. The procedural activities needed to verify the potential impact of the software changes on a system are de*			
LRU:			
SECTION	**TASK**	**TASK DESCRIPTION**	**TASK OBJECTIVES**
RESULTS			
E	**Verification/regression test strategy**	**Perform verification tests at the following levels:** 1. Unit/module testing 2. H/W & S/W integration test 3. Functional qulification test 4. Simulation test 5. Flight test	Assess S/W change impact at the following verification levels: 1. Perform code review, also assess structure test coverage 2. Develop unit test cases to verify algorithm/computational accuracy 3. Assess normal/abnormal requirements based testing 4. If re
RESULT			
F	**Development environmental change impact**	1. Verify changes resulting from step D4 2. Reassess steps C & E	
RESULT			
G	**Recommended S/W clasification level**	Using above criteria recommend S/W classification as major or minor	
RESULT			
H	**Comments**		
I	**Prepared by:**		**Reviewed by:**