

# **BEST FIT FOR MISSION SUCCESS**

## **ALIGNING DEVELOPMENT PROCESSES WITH MISSION CLASSIFICATIONS**

**David Pinkley**

**Ball Aerospace & Technologies Corp.**

**Chief Engineer, Mission Assurance**

**September 22, 2014**



**Ball Aerospace  
& Technologies Corp.**

**Agility to Innovate, Strength to Deliver**



## Topics

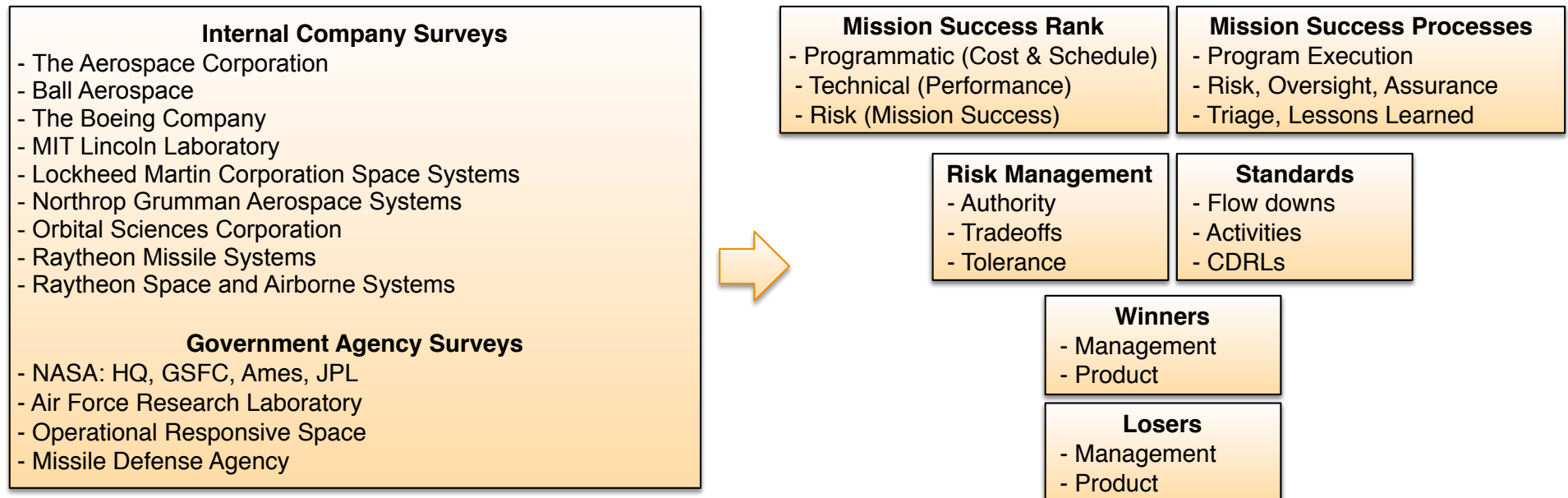
- “Leading with D” Challenge
- Summary Considerations
- Notable Insights
- Mission Class C/D Execution
- Development Process Alignment





# Leading With D Challenge

- **Mission Assurance Improvement Workshop Shaped**
  - TOR-**2010**(8591)-18: Mission Assurance Program Framework
  - TOR-**2011**(8591)-21: Mission Assurance Guidelines for A-D Mission Risk Classes
  - TOR-**2013**-00294: Key Considerations for Mission Success for Class C/D Missions
    - *Leading with D mandated, Survey Driven*
- **Survey Inclusive and Questions Cast a Wide Net**
  - **8 Companies, 4 NASA Centers, 4 DoD agencies**



***Leading with D Surveys and Products***



# Summary Considerations (Common Themes)

Category	Class C/D Consideration
<b>Mission Success</b>	<b>Threshold Requirements</b> <ul style="list-style-type: none"><li>- Cost—Schedule—Technical (Threshold) —Mission Success</li><li>- Success Criteria, Not Process</li></ul>
<b>Risk</b>	<b>Programmatic intolerant, Goals to Threshold Tolerance</b> <ul style="list-style-type: none"><li>- Bound Risk - Selective Yellow/Red Mitigation</li><li>- Experienced Leadership, Delegated Authority</li></ul>
<b>Standards</b>	<b>Best Practices Dependence</b> <ul style="list-style-type: none"><li>- Standards Intent</li><li>- CDRLs Lean/Limited</li><li>- Contractor Transparency Insight</li></ul>
<b>Processes</b>	<ul style="list-style-type: none"><li>- <b>Execution:</b> Pinpoint High Risk/Audit Others</li><li>- <b>Risk:</b> Technical Bounding, Supplier Sustainability</li><li>- <b>Triage:</b> Collaboration, Risk Impact</li></ul>
<b>“Winners”</b>	<ul style="list-style-type: none"><li>- <b>Management:</b> Empowered Small Dynamic Teams, Continuity, Transparency</li><li>- <b>Product:</b> Heritage, Burn-In, Simplicity, Subcontractor Reliance, System Redundancy</li></ul>
<b>“Losers”</b>	<ul style="list-style-type: none"><li>- <b>Management:</b> Autocratic Pressure, Unstable Budgets, Low Perceptivity Test</li><li>- <b>Product:</b> “Sunny Day” TAYF, Stacked Up Margins</li></ul>

**Considerations Establish the Roadmap for C/D Execution**




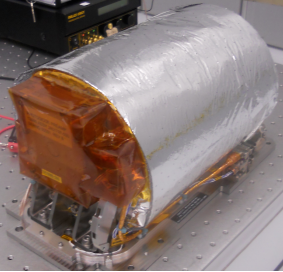
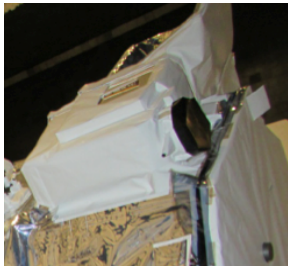

## Notable Insights (Independent Perceptions)

- **Process Tailoring:** (Who, What, When, Where) not (HOW)
- **Class A&B insurance:** Constant Failure Rate Assurance
- **Redundancy:** System, Dissimilar Redundancy & Graceful Degradation
- **Risk:** All Risks Assessed, Difference Mitigation Thresholds
- **Reviews:** Unbounded to Risk Profile Exploring Unknowns
- **CDRLs:** Risk Insight and Development
- **MA:** Process Integrity Focused
- **Opportunity:** Constraint Innovation
- **Decisions:** Quick Reasoned Decisions
- **Expectations:** Contractor and Customer Expectations Set at Award

**Notable Insights Highlight Core Implementation Principles**



# Mission Class C/D Execution Examples

Mission / C/D Theme	Restricted	GRACE-FO	CAVIS	TEMPO
	 <ul style="list-style-type: none"> <li>• Mission System <ul style="list-style-type: none"> <li>○ Space Vehicle</li> <li>○ Ground</li> <li>○ Launch</li> </ul> </li> </ul>	 <ul style="list-style-type: none"> <li>• Interferometer</li> <li>• JPL</li> <li>• 1 Yr.</li> <li>• Laser Ranging</li> </ul>	 <ul style="list-style-type: none"> <li>• Sounder</li> <li>• DigitalGlobe</li> <li>• 7.25 Yr.</li> <li>• Enhance Imaging</li> </ul>	 <ul style="list-style-type: none"> <li>• Spectrometer</li> <li>• NASA Langley</li> <li>• 2 Yr.</li> <li>• Urban Pollution</li> </ul>
<b>Mission Success</b>	• Discrete Demo	• TPM Thresholds	• Hosted Payload	• Commonality Driven
<b>Risk</b>	• Class (C-D) • L3/L2 EEE	• Class (D) • L3 EEE	• Commercial (B) • L2 EEE	• Class (C) • L3/L1 Common
<b>Standards</b>	• Best Practices • CDRLs (5)	• Best Practices • CDRLs (6)	• Commercial • CDRLs (6)	• Best Practices • CDRLs (26)
<b>Processes</b>	• Infant Mortality	• Infant Mortality	• EOL Margin	• Infant Mortality
<b>Winners</b>	• Empowered • High Heritage	• Partnership • Capability Based	• Partnership • High Heritage	• Partnership • Common Buys

**Ball Aerospace Product Class 3 Programs Align with C/D Themes**





# Development Process Alignment

- “Leading with D” Challenge Met
- Considerations/Insight Focuses “What Works”
- Demonstrated Success
- Emphasizes a Balanced Risk Approach with Distinct Process and Product Baselines

## Bob Manthy, Ball Aerospace

— Program Process Tailoring

## Bryan Gray, Raytheon

— Engineering Mission Success

