

Outline – Day 1 (November 9th)

Introduction		
Space Mission Record of Success		
Management Practices		
The Culture of Testing		
Lessons from Past Missions	Screening Out Design Errors	Galileo
		STS-51/TOS/ACTS & AC-34 Mariner 10
		WIRE
		I-90 Tunnel I-35 Bridge
	Screening Out Procedural Errors	AC-21
		TC-1
		TC-6
		NOAA N Prime China Air 120
	Impact of Weak Testing Practices	Hubble
		MPL
		Genesis
	System Engineering Lapses	Skylab
		X-43A
CONTOUR		
Software Mishaps	MCO	
Flawed Processes	Apollo 13 Explosion	
	AC-43	
Information Flow Breakdown	B-2A	
	AA 191	
Component Failure	AC-24	

Outline – Day 2 (November 10th)

Lessons from Past Missions (cont'd)	Experienced Teams make Mistakes	AC-67 Apollo 1 AC-62 TK 1951	
	Normalizing Deviance	Challenger Columbia Imperial Sugar Refinery	
	Missed Advanced Warnings	AC-33 Disneyworld Monorail Titan IVB-32/Milstar & AC-45	
	Perils of Heritage Systems	AC-5 Ariane 501	
	Sabotage	MDCA Microgravity Experiment	
	Management Factors Have Lost Missions	N-1 Helios AA 96 TK 981 EVA #23	
	Summary of Mishap Causes		
	The “Chain of Errors” Concept	The “Gimli Glider” Loss of the X-31	
	Two Lessons from a Different Perspective	From Space Station Freedom to the International Space Station Flawed Failure Investigation of Atlas/Centaur 70	
	Common Cause Failures		
The Human Element			
Applying the Lessons			
Conclusions			