Logistics, Scope, Goals

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California Institute of Technology
April 10, 2012

Welcome to the 2012 NASA Spacecraft Fault Management Workshop!

- ~100 attendees
- 34 organizations from government, industry, academia
- 4 NESC Technical Fellows
- Media
  - Video capture
  - Photos
  - Webcast
- Now, a word from our Sponsor, Lindley Johnson, NASA SMD/PSD Program Executive

2012 NASA SPACECRAFT
FAULT MANAGEMENT WORKSHOP

April 10-12 2012
New Orleans, Louisiana

Agenda

Day 1 - April 10, 2012

7:00 AM	QB	**Registration**
8:00 AM		**Introductions, Purpose, Goals -** Lorraine Fesq
8:15 AM		**Welcome** - Lindley Johnson
8:30 AM		**Agenda, Logistics, FM Handbook Status**
8:45 AM		**JPL/CalTech** - Brian Muirhead, "FM Across NASA"
		JHU/APL - Kris Fretz, "Recent progress in FM"
9:45 AM		Break
10:00 AM	QB	**Focus Area: "Assessing FM architectures" (Rec #8)**
10:15 AM		**NASA/MSFC** - Jon Patterson, "Analytical Approaches to Guide Space Launch System FM Development"
10:45 AM		**NASA/JSC** - Carlos Garcia-Galan, "FM for Crewed Entry"
11:15 AM		**Aerospace Corp** - Paul Schmidt, "Independent Assessment of NASA Fault Management System Architectures"
11:45 AM		**AFRL/W-P -** Mark Derriso, "State Awareness and Decision-Making Architecture"
12:15 PM	LN	**Lunch - Invited Speaker: Michael Aguilar** NASA GSFC, NESC Software Tech Fellow "Fault Management using MBSE Tools and Techniques"
1:15 PM	QB	**Focus Area: "Developing a FM Capabilities Roadmap" (Rec #6)**
1:30 PM		**NASA/ARC** - Mark Schwabacher, "Human Spaceflight ISHM Technology Development"
2:00 PM		**NASA/ARC** - Robert Mah, "System-Wide Safety Assurance Technologies"
2:30 PM		**JPL/CalTech** - Mitch Ingham, "No more Band-Aids: Integrating FM into the Onboard Execution Architecture"
3:00 PM		**JPL/CalTech** - Dan Dvorak, "Goal-Based FM"
3:30 PM		**NASA/JSC** - Lui Wang, "Modeling Failure Modes with SysML"
4:00 PM		Break
4:15 AM	QB	**NASA/MSFC, UCCS/Jacobs** - Stephen Johnson, "FM Technical Performance Metrics"
4:45 PM		**AFRL/W-P** - Mark Derriso, "AFRL's ISHM Journey and Future Plans"
5:15 PM	QP	**Steering Committee Meeting**
5:30 PM	IB	**Reception** **Iberville and Bienville Rooms - Second Floor**
8:30 PM		

Day 2 - April 11, 2012

8:00 AM	QB	**Invited Speaker: Dr. Werner Dahm** Director, Security and Defense Systems Initiative Ira A. Fulton Schools of Engineering, Arizona State University "ISHM: Applications and Challenges on the Horizon"			
9:00 AM		**FM Capabilities Roadmap Session Overview -** Ken Costello, Session Chair (IV&V Facility)			
9:30 AM		**Architecture Evaluation Session Overview** - John Day, Session Chair (JPL) and David Garlan (CMU)			
10:00 AM		**Breakout Sessions: Logistics**			
10:15 AM		Break			
10:30 AM	BC	**Architecture Evaluation Session - US Persons only** QP Breakout Session US Breakout Session	OR	**Capabilities Roadmap Session - US Persons only** PR Breakout Session GS Breakout Session	
12:30 PM	LN	**Lunch**	LN	**Steering Committee Meeting**	
1:15 PM	BC	**Architecture Evaluation Session - US Persons only** QP Breakout Session US Breakout Session	OR	**Capabilities Roadmap Session - US Persons only** PR Breakout Session GS Breakout Session	
2:45 PM		Break			
3:00 PM	BC	**Architecture Evaluation Session - US Persons only** QP Breakout Session US Breakout Session	OR	**Capabilities Roadmap Session - US Persons only** PR Breakout Session GS Breakout Session	
5:00 PM	RS	**Steering Committee Meeting**			

Day 3 - April 12, 2012

8:00 AM	QB	**Invited Speaker: Dr. Algirdas Avizienis** Distinguished UCLA Emeritus Professor "Terminology Issues in Dependable Computing"		
8:45 AM		**JPL/CalTech** - Steve Jenkins, "FM Ontology"		
9:15 AM		**NASA/ARC** - Peter Robinson, "FM as a Control System"		
9:45 AM		**NASA/OSMA** - Frank Groen, "FM in an Objectives-Based/Risk-Informed View of Safety and Mission Success"		
10:15 AM		Break		
10:30 AM	QB	**Panel Discussion: "Integrating FM: How Does It Fit?"** **Panel Moderator:** Marilyn Newhouse, MSFC/CSC **Panelists:** Michael Aguilar, NESC; Michael Brieden, JSC; George Cancro, APL; Stephen Johnson, MSFC/UCCS; Bob Rasmussen, JPL; Jonathan Wilmot, GSFC		
12:00 PM	LN	**Lunch**	LN	**Steering Committee Meeting**
1:00 PM	QB	**Architecture Evaluation Report & Discussion - US Persons only** John Day (JPL) and David Garlan (CMU)		
2:00 PM	QB	**Capabilities Roadmap Report & Discussion - US Persons only** Ken Costello (IV&V Facility)		
3:00 PM	QB	**Closing Remarks**		
3:30 PM	QB	**Steering Committee Meeting**		

Room Legend

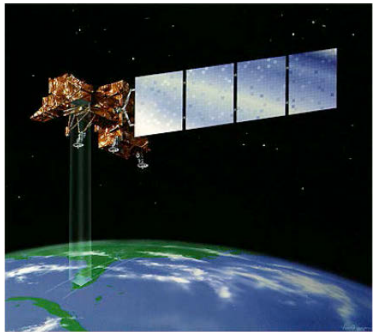
Mezzanine	QB	Queen Anne Ballroom
	BC	Bonnet Carre Room
	OR	Orleans Room
	QP	Queen Anne Parlor
	LN	La Nouvelle East
	IB	Iberville/Bienville Rooms
Second Floor	US	Ursaline Salon
	PR	Pontalba Room
	GS	Gallier Salon
	RS	Royal Salon B

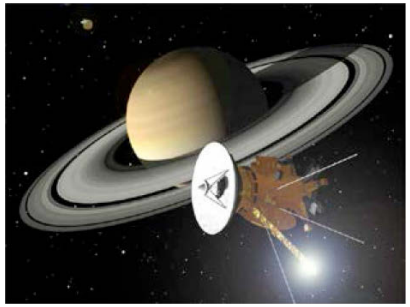
Logistics

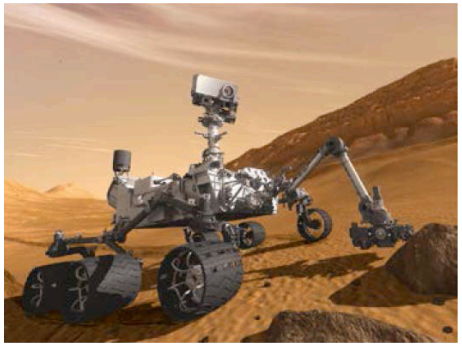
- Agenda is color-coded to indicate locations
- Every day, start in Queen Anne Ballroom
- Day 1 schedule is tight – I will be holding speakers to their allotted time.
- Day 1 presentations prepare us for Day 2 activities
- Day 2 plan: Split into 2 parallel Breakout Sessions
  - Go to one Session and stay there for the day. Discourage traveling
  - Introductions to each Session will be provided on Day 2
- Day 3 focuses on FM Handbook issues

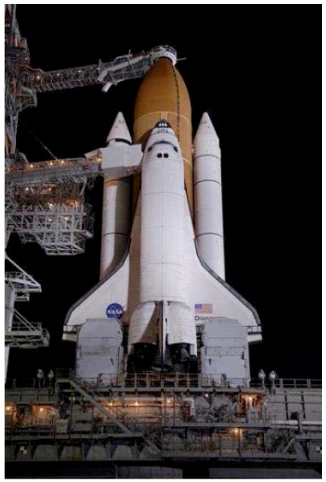
2012 Scope

- FM, ISHM, FP, IVHM, SHM, FDIR, RM, HUM
- HSM and OSMA focus this year
- Aeronautics, GS, MS next on the list









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Goals

- Bring FM LL and BP alive to benefit future missions
- Establish a vision for FM technology development
- Expose the different views/roles of FM on current missions
- Work toward consensus on key issues
- Plans for the next 3 days
  - Collect and Assess past FM Architectures
  - Develop a FM Capabilities Roadmap
  - Discuss via a panel the role of FM on a Mission
  - Mature the contents of the NASA FM Handbook

Day 3: Handbook Issues

- Terminology!
- What is the "science" that lies beneath FM?
- Confusion about FM vs OSMA responsibilities
- How does FM fit within a mission?
  - Part of SE's responsibilities?
  - Separate subsystem like power, ACS and thermal?
  - Additional duty for subsystem engineers?