



Progress of Crew Autonomous Scheduling Test (CAST) on the ISS

Matthew Healy, Jessica Marquez, Steven Hillenius, David Korth, Lauren Rush Bakalyar, Neil Woodbury, Crystal Larsen, Shelby Bates, Mikayla Kockler, Brooke Rhodes, William Moore, Ivonne Deliz, Bob Kanefsky, Jimin Zheng, Ashley Henninger, Isabelle Edlund, Jackelyne Silva-Martinez

NASA JSC Flight Operations Directorate

Operations Division, Flight Planning and Procedures Branch

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Overview



- What is CAST?
- Test Objectives
- Ground Preparation
- Playbook
- Scheduling Process
- Payload Status
- Closing Remarks



What is CAST?

- Crew Autonomous Scheduling Test = CAST
- Crew Planning as Operations Concept tested on ISS (part of NASA's Autonomous Mission Operations capability efforts)
- Increment 50-52
- 5 sessions upon Weekly Plan Review approval of CAST recommended opportunities

Familiarization & Training		Practice	Self-Schedule			
Session #1	Session #2	Session #3	Session #4	+2 days	Session #5	+2 days
Planning Familiarization (Fake day)	Execution Familiarization (Prepared Plan)	Schedule Afternoon (Limited Planning)	Self-Schedule	Execute Self-Schedule	Self-Schedule	Execute Self-Schedule

Test Objectives



Mission Success

- Mission objectives and priorities met

Efficiency

- Impact on productivity (crew time)
- Frequency of ground correction

Crew Satisfaction

- Level of satisfaction executing self-scheduled timeline

Ground Preparations



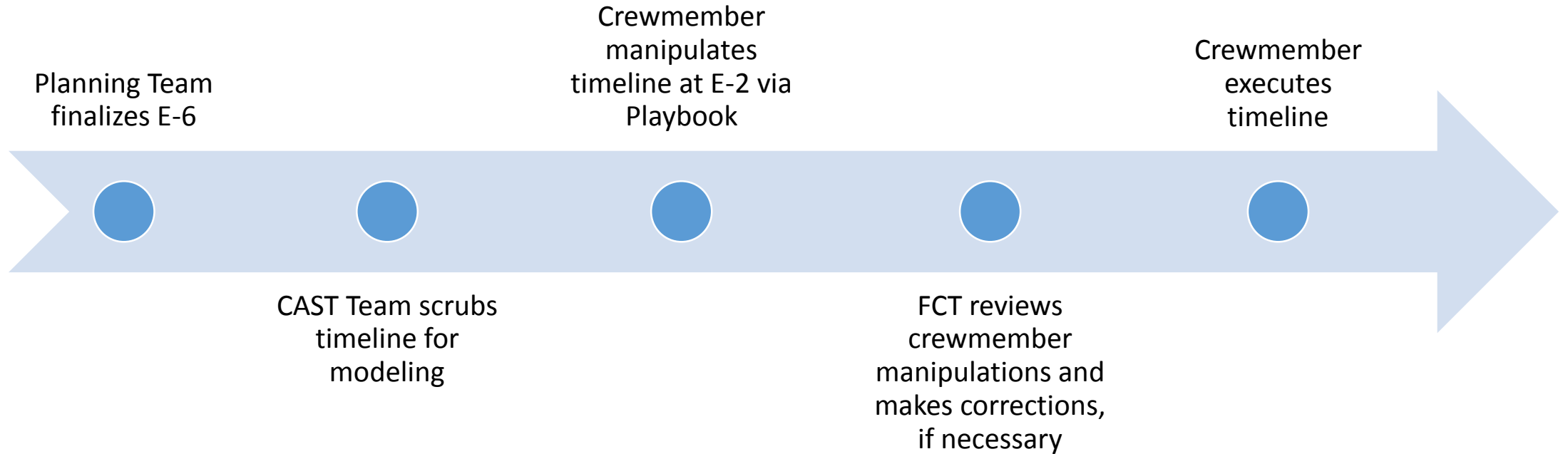
- Crew Time efficiency baseline:
 - Average crew time for 3 crew (one unit)
 - 20 nominal days in the middle of several increments
- Test day selection criteria
 - About 50% of the activities with modeled constraints
 - Fixed activities are kept to a minimum
 - The day is representative of a nominal work day on orbit

What is Playbook?



Playbook is an easy-to-use mobile web-based plan-execution tool designed for the crew.

Scheduling Process



E: Execution Day

Payload Status



- **Strategy:**
 - Crew spent early days getting familiar with the tool and scheduling concepts prior to scheduling and executing 2 mission days
 - Scheduling concepts include: scheduling from a tasklist, moving activities within the plan, obeying priorities, using the provided constraints
 - Ground planning team validates scheduled plans prior to crew execution (except for session #3)
- **Technique:**
 - Playbook tool highlights go/no go planning options based upon scheduling constraints
 - Crew is provided with supplemental aids to assist with planning process
- **Measures:**
 - Questionnaires and post-mission debrief sessions
 - Comparisons between expert solutions and crew solutions
 - Quantitative measure of crew execution efficiency

Closing Remarks



- Completed 3 sessions out of the 5 planned
 - CAST Process is better understood
 - Tools issues encountered were addressed
 - In session 3, crewmember effectively accomplished many self-scheduled activities
- Future Work:
 - Need to complete 2 more CAST sessions before the end of Increment 52

Thank you for your
attention!