







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

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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







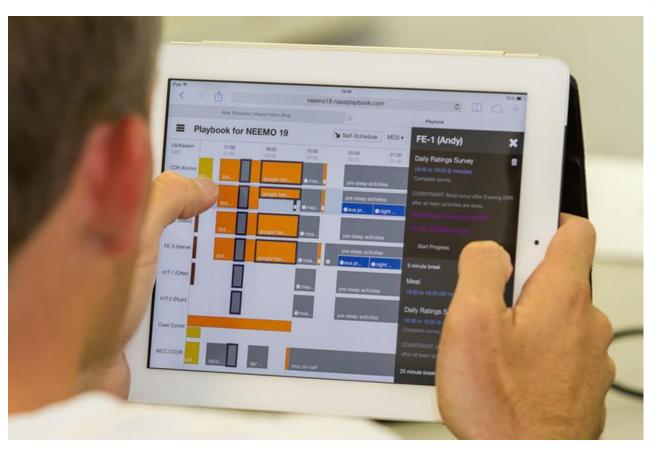
- Crew Time efficiency baseline:
 - Average crew time for 3 crew (one unit)
 - 20 nominal days in the middle of several increments
- Test day selection criteria
 - About 50% of the activities with modeled constraints
 - Fixed activities are kept to a minimum
 - The day is representative of a nominal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







Planning Team finalizes E-6

Crewmember manipulates timeline at E-2 via Playbook

Crewmember executes timeline











CAST Team scrubs timeline for modeling

FCT reviews crewmember manipulations and makes corrections, if necessary

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









- 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!