

# **NASA Advisory Council Space Operations Committee**

**July 28, 2010**

**Kennedy Space Center**

**Doubletree Hotel, Cocoa Beach, FL**

## **CONTENTS**

<b>OPEN SESSION—DISCUSSION (FACA) .....</b>	<b>3</b>
ACTIVITIES TO BE REPORTED .....	3
RECOMMENDATIONS, A REQUEST FOR BRIEFING, & AN OBSERVATION .....	5
FUTURE ACTIVITIES .....	7

*Meeting Report Prepared by:  
Winfield Swanson, Consultant  
Zantech IT Services Corp*

Wednesday, July 28

## Open Session—Discussion (FACA)

<i>Space Operations Committee Members Present</i>	<i>Others Present</i>
Col. Eileen Collins, <i>Chair</i> Dr. Pat Condon Dr. John Grunsfeld Ms. JoAnn Morgan Mr. Robert Sieck Mr. Jacob Keaton, <i>Executive Secretary</i>	Leslie Lake, Raytheon Dale Ketcham, Spaceport Research & Technology Institute (SRTI) Frank Van Rensselaer, Harris Corp Chris DeMars, Orbital Todd Halvorson, <i>Florida Times</i> Diane Rausch <i>[via telephone]</i> Winfield Swanson, <i>rapporteur</i>

Col. Collins welcomed everyone. Mr. Keaton introduced himself and read the FACA notice. Each member of this committee was appointed by Administrator Bolden for their special expertise; members will recuse themselves if they have a conflict of interest.

### ***Activities to Be Reported***

For Col. Collins' presentation to Administrator Bolden, 30 PowerPoint slides from yesterday's presentations as well as committee generated slides were selected.

### *Observations and Recommendations*

From the April 27 meeting, 2 recommendations were accepted and 2 need more work:

A common theme was collaboration between NASA centers, DoD, academia, industry, and international partners.

*Discussion:*

- *Dr. Condon* lamented that inter-group communication is almost entirely personality-dependent. *Ms. Morgan* noted that where other people's money is being used, there may be reason, and *Dr. Grunsfeld* opined that the trend may be changing as younger people seem to be more collaborative by nature.
- *Col. Collins:* The public is not aware of all the plant and bacterial research being done, so we need more focus on public outreach—e.g., microbial maps, calcium carbonation, UV light.
- *Ms. Morgan:* ISS is a new national lab and we want the public to consider ways to use it.
- *Ms. Morgan:* Also, the Shuttle will not be flying and the history of how things get up there and back is largely unknown
- *Mr. Sieck:* An associate program could address space only, not what they bring back and continue to work on.
- *Dr. Grunsfeld:* KSC, the smallest center, could be used as an example. It should be accessible from the NASA Web portal. (There used to be software that would manage such a thing.) *Col. Collins:* We could take this idea to the Technology Innovations Committee.

KSC Technology Development Examples:

- Electrostatic Physics Lab, e.g., dust mitigation technology, applications to solar panels, Hubble spectrometer
- Corrosion Lab, e.g., coating with microcapsules, self-healing/-detecting
- Bioregenerative Life Support Lab, e.g., producing plants with more antioxidants (gene expression); waste management, bioreactors (engineer functions of bacteria at DNA level), electrical charges generated from space suit
- Applied Physics Lab, e.g., laser measuring device for distance measurement; radiation shielding; ice detection; ultrasonic lead detection
- Applied Chemistry Lab, e.g., PCB removal; toxic leak detection
- Cryogenics Test Lab, e.g., tank insulation to minimize boil-off; aerogels; wire insulation—detection and healing layer
- Space Life Science Labs—has come a long way, but funded by academia, et al.

The Space Life Science Laboratory, available for use by commercial launch companies, was built c. 2004. It covers 100,000 square feet, cost \$30 million, and was funded by the state of Florida. It is the anchor laboratory facility for the new Exploration Park Research Complex, and it has room for future development. The NAC visited it in 2008. (Add a picture of Exploration Park.)

### **Recommendations, a Request for Briefing, & an Observation**

#1. Title: *Ensuring ISS Capabilities Are More Widely Known*

*Recommendation:* The committee recommends that NASA make the ISS capabilities, achievements, and potential services more widely known outside the NASA community, especially within the business world. Consideration should be given to new and innovative mechanisms.

#2. Title: *Establishment of a Technology and Development Encyclopedia*

*Recommendation:*

Establish a new technology and development encyclopedia across all NASA disciplines.

*Major Reasons for Recommendation:*

There is a wealth of world-class R&D going on at NASA centers all across the enterprise, and the mechanism for communicating the content and value of that research beyond the NASA community is not well known. Each center publishes a report of its own work, e.g., KSC's *Tech Transfer*. This information should be readily available on line to other researchers and the public; information should include a timely and short description of noteworthy features, e.g., 3 centers do cryogenics.

#3. Title: *Operational Model for Commercial Space Vehicles, both Cargo and Crew*

*Recommendation:* (brought from April 2010 meeting)

Develop an operational model for commercial space vehicles that will enable NASA flight resources and crews to be committed to commercial space systems.

*Major Reasons for Recommendation:*

There is an operational plan for H-II Transfer Vehicle (HTV)

- *Dr. Grunsfeld:* HTV offers a model, but, as *Mr. Sieck* said, it still gets back to whether NASA has more than specifications. If so they should be documented.
- *Dr. Condon:* As things unfold and plans become more complete, we should think about the role of NASA astronauts. But we don't know enough at this point. *Col. Collins* pointed out that vehicles may be flown by either commercial pilots or NASA astronauts.
- *Dr. Grunsfeld:* Commercial projects include those on non-NASA business and they may not want to leave for some time. *Dr. Condon:* We don't want to stifle innovation. Current astronauts should have a significant role in decisions made. There is risk in basing decisions on the available but circumscribed information you happen to have.

The group decided to leave this recommendation until they have more information.

#4. Title: *Operational Plan for the CRS Firms (brought from April 2010 meeting)*

*Recommendation:*

Develop an operational plan for the Commercial Resupply Service firms from launch to end of mission.

*Major Reasons for Recommendation:*

FAA is prescribing a process rather than a checklist.

#5. Title: *Objectives, Goals, and Strategic Plan (brought from April 2010 meeting)*

*Recommendation:*

NASA should establish and communicate specific objectives and goals for the near term (0 to 5 years), mid term (5 to 15 years), and far term (15 to 30 years) to guide its future direction in the areas of science, space exploration (human and non-human), and aeronautics. Following the establishment of these objectives and goals, NASA should update its strategic plan to chart a course to achieve these objectives and goals.

*Major Reasons for Recommendation:*

NASA does not appear to have a clearly articulated set of specific objectives and goals for its future direction. In addition, its current strategic plan is 4 years old and does not reflect new national priorities.

- *Dr. Grunsfeld:* The Space Act is a good guidance document. People who are paying for this need to understand the procedure, i.e., design, build, and test a heavy lift within a certain length of time. *Dr. Condon* cautioned that no one wants Congress defining payload requirements. Rather, heavy lift development should come as a result of establishing these goals and objectives, e.g., does “go to Mars” mean land or circle, stay a short or a long time? *Dr. Grunsfeld:* But by now we are talking about 2050, and there is talk of a mid-decadal survey for Earth Science and Space Science. *Dr. Condon:* Without specific goals you run the risk of never accomplishing anything (“If you don’t know where you’re going, any road will take you there”).

#6. Title: *Using ISS as a Testbed for Future Exploration*

*Request for Briefing:*

Describe how deep space flight operational concepts are being developed or used on ISS.

*Major Reasons for Request:*

ISS is a useful spacecraft for developing operational concepts for deep space, including time-delayed communication, long-duration crew isolation simulating transit to Mars, and Mars simulation on Earth return. Describe the extent to which these operational concepts are semi-autonomous or can be demonstrated.

- *Dr. Grunsfeld* thought this was a PR exercise. The 6-month transit to Mars is 100% simulated on ISS, except for radiation and time-delayed communication, and this would demonstrate time delays in communication with Earth. We should start simulating a Mars trip when astronauts return to Earth. The National Security Policy Director and the President affirmed that ISS should be used for this. The Russians are also working on this. On ISS, 18% of human time is available.
- The proposed recommendation was revised to be a request for briefing.

#7. *Observation: (repeat from April 2010 meeting)*

Due to recent announcements in proposed national policy resulting from a changing environment, there is a need for the deliberate and careful integrated planning of the transition to the new direction, including careful planning of the Shuttle manifest transition of the Constellation program and development of the 21<sup>st</sup> Century Launch Complex and Technology Development Programs.

Col. Collins raised this issue at the April meeting, but thinks it warrants inclusion again.

### ***Future Activities***

Col. Collins wanted to recognize John Shannon and the Space Shuttle Program for their contributions.

The next meeting will be September 13-14, 2010, at Johnson Space Center.

Speakers and topics for the next meeting were considered:

#### *Topics:*

- A presentation on the Shuttle Manifest
- Crew involvement in commercial space options
- Col. Collins will ask everyone to send their top 3 issues just before the September meeting.

*Adjourned 5:15*