45th Annual AIAA Aerospace Sciences Meeting – Special Session

The International Space Station- A New National Laboratory

0800-1200 Thursday, January 11, 2007

AGENDA

08:00	***Welcome & Introduction***	Mr. Mark Uhran NASA Assistant Associate Administrator for International Space Station (ISS)

TECHNICAL BRIEFS

08:20	***ISS Research Progress to Date***	Dr. Julie Robinson NASA ISS Program Scientist (acting) ISS Payloads Office
08:40	***NASA Human Research Plans***	Dr. Neal Pellis NASA Associate Director Space Life Sciences Directorate
09:00	***ISS Post-Assembly Accommodations & Resources***	Mr. John Uri NASA Manager ISS Payloads Office
09:20	***Commercial Orbital Transportation Services***	Mr. Valin Thorn NASA Deputy Manager Commercial Crew & Cargo Program
09:40	***International Relationships***	Mr. Dan Jacobs NASA Manager International Programs
10:00	***National Laboratory Applications Development***	Mr. Mark Uhran
10:20	**Break & Resume with Panel Session at 10:30**	

PANEL SESSION

Mr. William Gerstenmaier, NASA Associate Administrator, Space Operations

Mr. Jeff Bingham, Staff Officer, US Senate

Dr. Peter Banks, Principal, Red Planet Capital, Inc.

Dr. Franklin Chang-Diaz, CEO, Ad Astra Rocket Co.

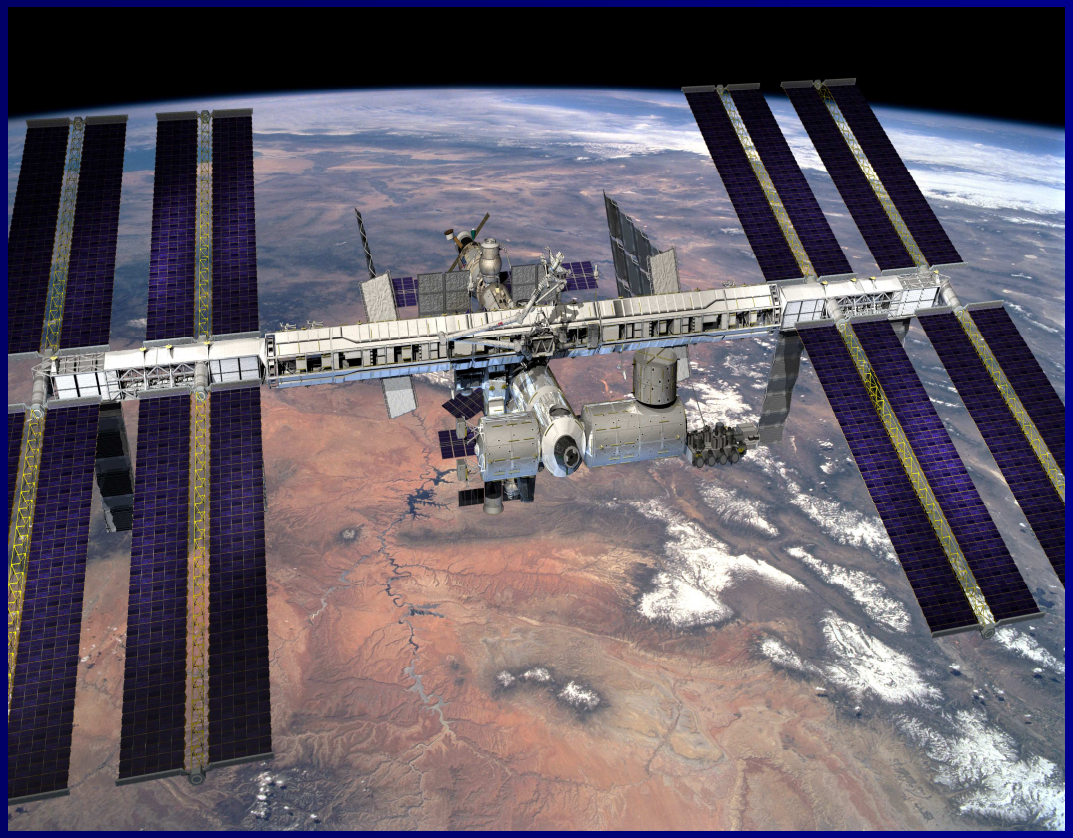
Mr. Alan Lindenmoyer, NASA Manager, Commercial Crew & Cargo Program

Ms. Joy Bryant, ISS Program Manager, Boeing Co.

Mr. Pat McKenzie, Director of Orion Project Business Development, Lockheed-Martin Co.

12:00 **ADJOURN**

International Space Station
National Laboratory Applications Development



45th Annual AIAA
Aerospace Sciences Meeting

Special Session:
ISS a New National Laboratory

11 January, 2007
Reno, NV

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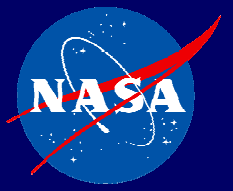


- National Policy Background
  - ISS Mission
- ISS Event Horizon
- Objective and Constraints
- Strategy and Actions
- Conclusion

National Policy Background

NASA Authorization Act of 2005, Sec.507 NATIONAL LABORATORY DESIGNATION (Public Law 109-155)

(a) Designation- To further the policy described in section 501(a) [maintain capability for human access to space on a continuous basis], the US segment of **the** ISS is hereby designated a national laboratory.

(b) Management-

1) PARTNERSHIPS-- The Administrator shall seek to increase the utilization of the ISS by other Federal entities and the private sector through partnerships, cost-sharing agreements, and any other arrangements...
2) CONTRACTING-- The Administrator may enter into a contract with a non-governmental entity to operate the ISS national laboratory, subject to all applicable Federal laws and regulations.

National Policy Background continued….

(c) Plan-- the Administrator shall transmit to [applicable Congressional oversight committees] a plan describing how the national laboratory will be operated. At a minimum the plan shall describe--

(1) any changes in the research plan transmitted under section 506(3) and any other changes resulting from the designation;

(2) any ground-based NASA operations or buildings that will be considered part of the national laboratory;

(3) the management structure for the laboratory, including the rationale for contracting or not with a nongovernmental entity to operate the ISS national laboratory;

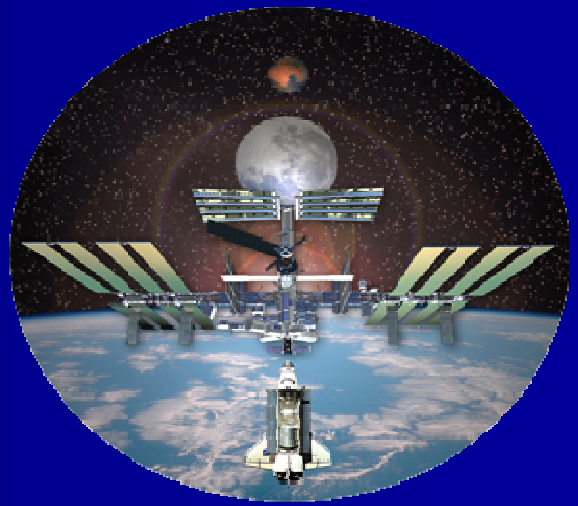
(4) the workforce that will be considered employees of the national laboratory;

(5) how NASA will seek the participation of other parties described in subsection (b)(1); and

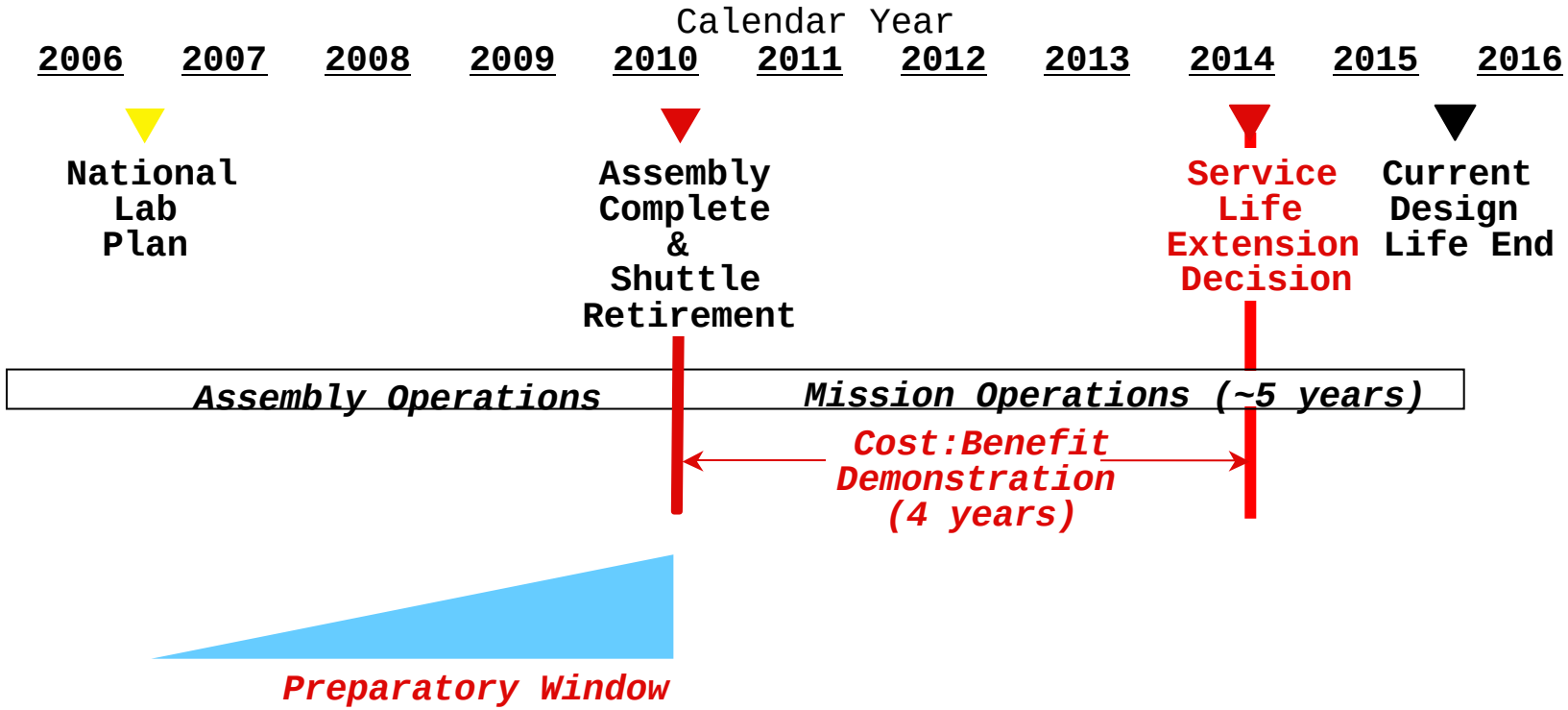
(6) a schedule for implementing any changes in ISS operations, utilization, or management described in the plan.

ISS Mission

- **ISS mission is now directly aligned with National Vision for Space Exploration:**
  - ✓ Research, development, test and evaluation of ***biomedical protocols for human health and performance*** on long-duration space missions;
  - ✓ Research, development, test and evaluation of ***systems readiness*** for long-duration space missions, and;
  - ✓ Development, demonstration and validation of ***operational practices and procedures*** for long duration space missions.



ISS Event Horizon



Objective

- **Develop non-NASA users for ISS accommodations and resources capacity currently available during the post-assembly period.**
  - **Establish partnerships with government, academic and industrial participants.**
  - **Produce diversified portfolio of productive applications projects contributing to US economic growth.**

Constraints

- **NASA exploration mission uses of the ISS must command top priority for ISS payload resources and accommodations.**

- **Funds necessary for OGA uses of ISS National Laboratory must be appropriated outside of FY 2007 and subsequent NASA appropriations.**
  - No impact to NASA's primary mission.
  - *NASA will continue to cover cost of ISS maintenance and operations.*

Strategy

- **Pursue ISS Applications Development through NASA HQ Office of Space Operations.**
  - Memoranda of Understanding (MOUs) with other government agencies…
  - Space Act Agreements (SAAs) with private firms…
  - Coordinated with ISS Program and Office of General Counsel.

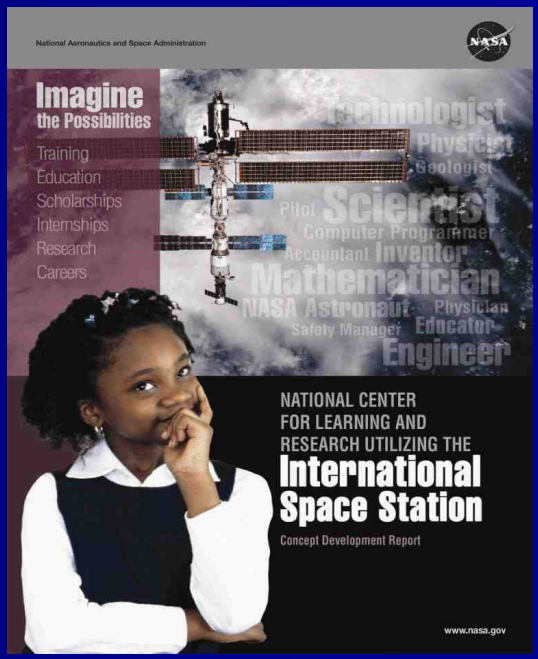
- **In parallel, determine pros/cons and most effective approach to creating an authority that could take responsibility for further non-NASA program development in next decade.**
  - Study of potential legal frameworks by Office of General Counsel.
  - "Form follows function" approach at this early stage.

NASA Actions to Date: Education

- Launched NASA Office of Education outreach project to US Department of Education and STEM education-relevant agencies (NIH, NSF, DOD…)
- Linkages to PACE & ACI

Protecting America's Competitive Edge

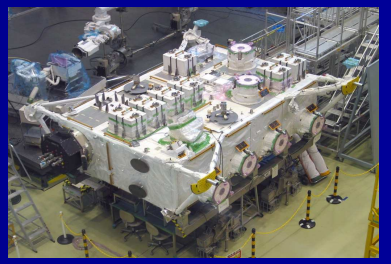
- Initial reactions affirmative.



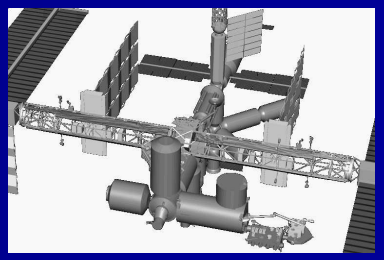
NASA Actions to Date: Technology Demonstrations

✓ = technologies planned or in development discussions

- ✓ **IVA/EVA environmental control/life support** (***regenerative ECLS, commercial O2 supply service, LED lighting***)
- ✓ **electrical power generation, transmission, storage** (***Li+ batteries, fresnel concentrating lenses***)
- ☐ **thermal control**
- ✓ **guidance, navigation & control** (***x-ray pulsar based navigation***)
- ☐ **communications**
- ☐ **data management systems**
- ✓ **propulsion & attitude control** (***electric propulsion test bed***)
- ☐ **cryogenic fluids handling**
- ☐ **robotics & autonomous systems**
- ☐ **structures & mechanisms**
- ✓ **materials** (***materials on ISS experiment system***)



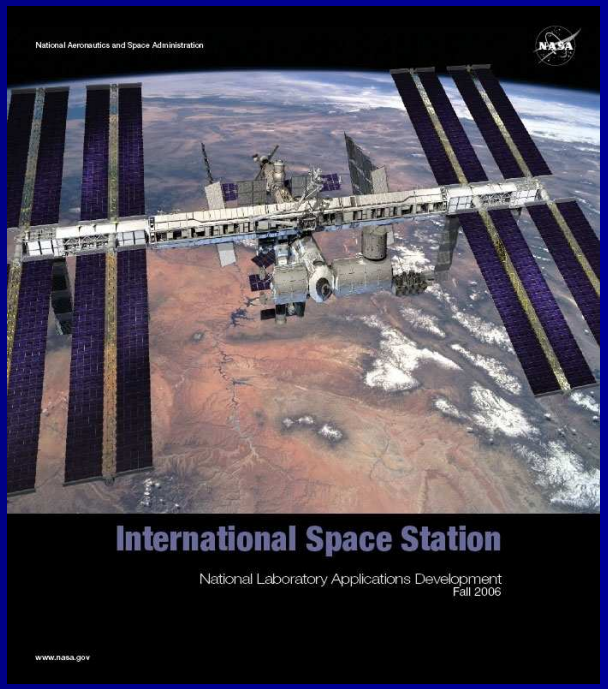
Exposed Facility Accommodations



External Truss Accommodations

NASA Actions to Date: Administrator Invitation

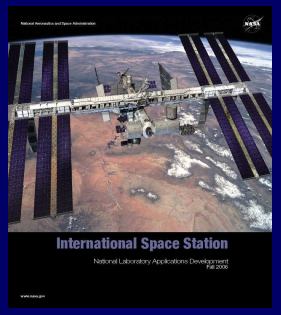
- ✓ Secretary of Energy
- ✓ Secretary of Commerce
- ✓ Director, National Institutes of Health
- ✓ Director, National Science Foundation



NASA Actions to Date: Meetings & Conferences

May 16, 2006	NASA Ames Research Center Commercial Space Forum
Sep. 20, 2006	Potential for ISS Educational Initiatives NSF-Hosted Interagency Workshop
Nov. 7, 2006	Annual Meeting of the Space Experiments Review Board DOD/USAF-Hosted
Dec. 4, 2006	NASA Advisory Council Space Operations Committee Fact-Finding Session: ISS as a National Laboratory
Dec. 8, 2006	Meeting on Space-Related Health Research NIH-Hosted Roundtable
Jan. 11, 2007	45th Annual AIAA Aerospace Sciences Meeting Special Session: ISS - A New National Laboratory

NASA Actions to Date: Publications



- **Congressional Report, June 2006 -** ***NASA Research and Utilization Plan for the ISS***
- **NASA/TP-2006-213721 -** ***Inspiring the Next Generation: Student Experiments and Educational Activities on the ISS, 2000 - 2006***
- **NASA/TP-2006-213146 -** ***International Space Station Research Summary Through Expedition 10***
- **NASA/TP-2005-213166 -** ***Exploration-Related Research on the ISS: Connecting Science Results to Future Missions***
- **Library of Congress ISBN 0-9710327-2-6** ***Reference Guide to the International Space Station***
- **Digital Video Disc -** ***International Space Station Fly Around Animation***

Conclusion

- **The National Laboratory concept is an opportunity to expand the US economy in space-based research, applications and operations.**
- **The International Space Station represents a unique and highly visible national asset with surplus capacity available for a wide spectrum of applications.**
- **NASA will continue to cover cost of operating and maintaining the ISS, and is highly motivated to work with other agencies and organizations to pursue applications.**