Commercial Space Transportation Advisory Committee
October 26, 2005
MEETING MINUTES

COMSTAC Chair John Vinter, Chairman, International Space Brokers, Inc., Rosslyn, Virginia, convened the meeting at 8:33 a.m. He began by introducing the U.S. Secretary of Transportation Norman Y. Mineta.

Remarks by U.S. Secretary of Transportation Norman Y. Mineta

Secretary Mineta greeted the COMSTAC members. He began by acknowledging the success of the recent X Prize Cup event that took place in Las Cruces, New Mexico and acknowledging COMSTAC members Mike Kelly and Lou Gomez for their work in support of the event. Secretary Mineta compared the recent commercial human space flight activities to the era of the first scheduled trans-Atlantic jet flight by an American airline from New York to Paris 47 years ago. He pointed out the convergence in aviation and space flight and praised the American entrepreneurial spirit, the innovation, creativity and drive of the representatives of the U.S. commercial space transportation industry.

Secretary Mineta highlighted the work of the FAA Office of Commercial Space Transportation under the leadership of Patricia Smith. He also emphasized the support of the commercial space transportation by the Bush Administration and the importance of the Commercial Space Launch Act, which provides for the Secretary of Transportation to have responsibility for the U.S. commercial space transportation industry. The Secretary concluded his remarks by acknowledging the work of Committee members by stating that " ...We are at the horizon line between yesterday and a new sunrise for space flight and with men and women with your experience and your passion on the front lines, it looks to be a brilliant day."

AST Activity Report

Dr. George C. Nield, FAA Deputy Associate Administrator for Commercial Space Transportation, provided an update of the activities of FAA's Office of Commercial Space Transportation (AST) since the May 2005 meeting. Dr. Nield began his remarks by emphasizing the strong connection between space travel and Washington, DC, specifically the U. S. space program and the Congress. He used the illustration of a famous American, Edward Everett Hale, a writer who served as the chaplain of the Senate in the early 1900's, who also wrote a story about space travel.

Dr. Nield reported that for FY 2005, there were six licensed launches (three by Sea Launch, two Atlas launches, and one SpaceShipOne flight). He also reported on the space panel which AST organized for FAA's 2nd Annual International Aviation Safety Forum in Chantilly, Virginia on October 20-21, noting that the panel included COMSTAC member, Elon Musk; Air Force Major General Jay Edwards (retired); former

Astronaut Hoot Gibson; Dennis Tito, the world's first space tourist; Will Whitehorn, president of Virgin Galactic, and Bob Walker, former Chairman of the House Science Committee, who chaired the panel.

Dr. Nield also reported that over the last six months AST has continued work on several notices of proposed rulemaking, including one on human space flight and one on experimental permits for reusable sub-orbital rockets; granted a no-issues letter to Honeywell for its design of a range safety telemetry system; and completed four license renewals. He also pointed out AST's publication, ***"FY 2005 Research and Development Accomplishments,"*** released in October. He also mentioned other accomplishments, including support of the Shuttle return to flight and work on the Oklahoma Spaceport environmental documentation.

Dr. Nield highlighted recent important events for space which made headlines, including the X Prize Cup, the donation of SpaceShipOne to the Smithsonian's Air and Space Museum by Burt Rutan and Paul Allen, the flight of Greg Olsen to the International Space Station on a Russian rocket which was brokered by Space Adventures, the announcement by Peter Diamandis of the formation of the Rocket Racing League, the manned space launch by the Chinese, and the formation of the Spaceship Company by Burt Rutan and Sir Richard Branson, which proposes to market and build spaceships for commercial human space flight. Dr. Nield noted that COMSTAC member George Whitesides was one of the first to buy a seat with that company.

Dr. Nield summarized his report by noting that "...This is all about dreams. It's about a long and often challenging journey from deep in the souls of authors and storytellers into the minds of inventors, engineers and analysts and finally into the hands of the men and women who build and fly these amazing machines that are somehow able to break the bonds of earth and reach out to touch the heavens."

The FAA International Aviation Program

Joseph H. Bogosian, FAA's Assistant Administrator for International Aviation presented information regarding the Office of International Aviation, emphasizing the role of that office as one that cuts across other FAA Lines of Business, providing support in the area of international aviation issues. He noted that one of his goals as the newly-appointed Assistant Administrator, is to ensure that his office, including the FAA offices overseas, are providing the best service to other offices within the FAA involved in international issues. He added that the FAA standard for aircraft certification is the global gold standard. He offered his support and assistance to COMSTAC members and other industry representatives dealing with international matters.

COMSTAC member Livingston Holder asked about the FAA view of future relationships between the U.S. commercial enterprise and Chinese space activities. Mr. Bogosian replied that his office and AST would be working together to build relations with China, while at the same time working to maintain the U.S. leadership in human space flight.

COMSTAC member Debra Lepore asked for Mr. Bogosian's perspective, as a former official of the Department of Commerce, on export trade controls and the impact on space. He responded that the process is a problem for industry and that the State Department is working to try to make the process better. He added that Federal agencies such as FAA, Departments of Commerce and State, and the National Security Council, should develop partnerships to help improve the process.

COMSTAC member Frank DiBello asked Mr. Bogosian to identify specific challenges and/or opportunities that he would like COMSTAC to address. Mr. Bogosian mentioned Russia and China, and the need for developing countries to enhance their transportation infrastructures to support economic development such as export and tourism. Chairman Vinter pointed out that China is now approaching the West in terms of insurance coverage as opposed to 10 years ago when they had the highest insurance rates. He also mentioned the negative impact that the U.S. export controls process is having on American satellite companies and the commercial space industry in general. COMSTAC member Frank Culbertson asked if the Department of Commerce could quantify the business loss as a result of the export controls process. Mr. Bogosian responded that the process would be to quantify the loss and next address the issue of national security, i.e., whether a technology is a national security threat. COMSTAC member Mike Kelly commented that, in the past, there was a strict policy that required a demonstration of a threat to national security when classifying weapons data in order to prevent materials from being classified unnecessarily.

Update on NASA Programs

Brant Sponberg, program manger for the Centennial Challenges Program, National Aeronautics and Space Administration (NASA), briefed the Committee on recent NASA commercial launch initiatives under Administrator Michael Griffin. He began by discussing the three types of NASA procurement mechanisms: 1) service procurements, especially the Commercial Services type under Part 12 of the Federal Acquisition Regulations; 2) Other Transaction Authority, especially Funded Space Act Agreements which allow flexibility and stimulate markets and technology; and 3) prize competitions, for which NASA is seeking authority to do prizes larger than $250 thousand.

Next, Mr. Sponberg discussed the three categories of programs designed to involve the commercial sector, starting with Other Activities for suborbital launch and low-cost earth-to-orbit (ETO) launch. He noted that the suborbital launch category includes proposals for the development of the X-Cup Lander Analog, a lunar lander that would take off and land vertically and achieve speeds of about Mach 5, with applications for transglobal transport; and the X-Cup Altitude, which will be a competition that sets a certain altitude goal. He added that this category also focuses on service contracts for microgravity experiments and astronaut training which would have astronauts fly on suborbital vehicles before their Shuttle flights. For low-cost ETO activities, Mr. Sponberg discussed the proposal for a low-cost launch vehicle for responsive space lift for small commercial bio-tech payloads, similar to the DARPA-developed Falcon for military applications. He added that NASA is also looking to reduce the number of launches normally conducted before an expensive science payload is launched.

Mr. Sponberg discussed the next program area, commercial crew/cargo for International Space Station (ISS), beginning with proximity operations for upmass (both pressurized and non-pressurized) to the ISS, i.e., taking materials to the ISS, including rendezvous, docking, and berthing; and Earth reentry or ISS downmass, i.e., bringing experiments or expensive equipment back to Earth. He reported that a draft solicitation for demonstration flights using OTA will be released before Thanksgiving. He emphasized the fact that NASA Administrator Griffin's preferred approach for supporting the ISS is through commercial services and relying less on foreign partners, adding that NASA would be developing the crew exploration vehicle and procuring some Russian vehicles, with the hope of transitioning to commercial service by 2010. Next, he discussed crew transport, the final category in this program area, reporting that NASA plans to offer a prize for an orbital crew vehicle demonstration, i.e., taking a crew to orbit and back to Earth.

He reported on other activities, including prizes for in-space propellant provisioning through cryogenic storage (keeping propellants stored for long periods on orbit without losing them) and transfer of propellants; and for small lunar transport, landing a small payload on the moon in the $20-40 million price range.

COMSTAC member Lou Gomez asked whether the lunar landing vehicles would be required to demonstrate the ability to land and operate at altitude while on Earth, and whether vacuum chambers or modeling be required for the demonstrations.
Mr. Sponberg replied that they would require actual demonstrations, but the specific requirements are still being discussed

COMSTAC member George Whitesides asked about the timing for the upcoming procurements. Mr. Sponberg replied that the draft solicitation of the procurement would be released at Thanksgiving and that NASA would probably hold an industry day for vendors soon afterwards. He added that NASA would gather comments, make revisions, issue a final solicitation before the first of the year and hopefully have a final selection by May. He noted that NASA is working to make the procurements as commercial as possible, with fixed-price arrangements, and delivery milestones with payment on delivery.

COMSTAC member Livingston Holder expressed concern about the proposal to have companies take on more risk for newly-developed services as opposed to the traditional commercial satellite procurement where NASA purchases well-developed and well-used products. Mr. Sponberg responded that companies should be prepared to take some of the risks since many of the products will be available to other customers; that NASA is not requiring, in all cases, a "clean-sheet" development so companies will be able to use traditional technologies and historical capabilities, including human space flight technologies and other launch technologies.

Tim Hughes of Space Exploration Technologies Corporation (alternate for COMSTAC member Elon Musk) and Elaine David of Lockheed Martin Corporation (alternate for

COMSTAC members Tom Marsh and Mark Albrecht) asked about NASA's plans for indemnification and Ms. David also asked about the potential impact of the Iran Nonproliferation Act on commercial crew cargo and other Shuttle-related activities. Mr. Sponsberg responded that NASA is still examining the issue of indemnification and is trying to include the use of foreign technologies in the solicitation, although the use of Russian equipment may be a problem.

The X PRIZE Cup

COMSTAC member Mike Kelly provided a briefing on the Countdown to the X PRIZE Cup event which took place in Las Cruces, New Mexico, October 6-9, explaining that the X PRIZE Cup is an annual version of the Ansari X PRIZE, which will be held in New Mexico at the Southwest Regional Spaceport, designed to stimulate progress in technology for space flight. He reported that events included exhibits by Cup participants, FAA and NASA; two XCOR Aerospace E-Z rocket flights; a vertical take-off and landing by Armadillo Aerospace; and an F-117 fly-by.

Mr. Kelly reported that there were between 10,000 to 20,000 attendees and that it was very popular with students. He added that plans are already underway for the 2006 event and one of the events proposed is a vertical drag race with two vehicles racing vertically.

Proposed U.S.-India Launch Trade Agreement

Kenneth Schagrin, director of Telecommunications Trade Policy in the Office of the United States Trade Representative (USTR), reported on the proposal for a U.S.-India Launch Trade Agreement. He noted that in 2004, the Next Steps in the Strategic Partnership (NSSP) was established to "... expand civilian, nuclear, space, high-tech and missile defense cooperation between the U.S. and India ..." allowing companies from both countries to engage in a variety of commercial activities and joint ventures. In April, the U. S. Secretary of State and the Indian Foreign Minister organized the U.S.-India Civil Space Working Group, to facilitate cooperation in space. He added that under the NSSP, the scope of bilateral commercial satellite cooperation was expanded.

Mr. Schagrin reported that within this framework, both countries are considering the negotiation of a launch trade agreement that would allow Indian launches of U.S. commercial satellites or third-party satellites containing U.S. parts. He reported that the USTR is currently considering the types of provisions that such an agreement would contain, but there have not been any negotiations as yet. He added that the negotiations on the issue of India's access to U.S. satellite technology are under the Technology Safeguards Agreement through the State Department.

Elaine David asked with whom is USTR consulting and how does the interagency working group operate. Mr. Schagrin responded that USTR is consulting with several of its advisory committees, and representatives from the satellites and reusable launch vehicle industries. He added that they are currently working with the Departments of Commerce and State. Chairman Vinter asked whether there is a role for COMSTAC and Mr. Schagrin replied that USTR would like as much input and feedback as possible from COMSTAC.

WORKING GROUP REPORTS

Risk Management Working Group (RMWG)

Chris Kunstadter, Executive Vice President, United States Aviation Underwriters, Inc., provided a report on the RMWG meeting on Tuesday, October 25, noting that RMWG Co-Chair, Janice Sadler, was unable to attend. He reported that the working group focused on the report on the extension of the indemnification regime currently in progress by the Aerospace Corporation, asking for input from any interested party, and noting that the draft report would be available in early 2006.

Mr. Kunstadter also provided a brief update on the status of the insurance market, stating that the insurance industry may see losses of $60 to 80 billion as a result of the three hurricanes in the U.S., four hurricanes in the Caribbean, the typhoon in Japan and the Southeast Asia tsunami. He added that because of these losses, companies may be reluctant to allocate capital to the insurance market, and for these reasons, the indemnification scheme for the space industry is even more important.

Chairman Vinter recommended that the Committee review the report by the Aerospace Corporation when the draft is completed and Ms. Smith agreed to check with the Aerospace Corporation regarding that recommendation.

RLV Working Group (RLVWG)

RLVWG Chair Mike Kelly reported provided a summary of the RLVWG meeting on Tuesday, reporting on the presentations at that meeting and the action items. He reported that the RLVWG heard a briefing from Will Pomerantz of the X PRIZE Foundation, and held discussions about ITAR and other action items.

Launch Operations and Support Working Group (LOSWG)

Alfred Wassel, manager of the FAA Commercial Space Transportation Safety Office at Patrick Air Force Base, provided the LOSWG report for COMSTAC member and LOSWG Chair, Don Pettit, who was unable to attend. Mr. Wassel reported that the LOSWG received briefings on the AST R & D Requirements by Chuck Larsen of AST; the Commercial Space Launch Requirements by Kelvin Coleman of AST and Lt. Col. Tim Brown of the Air Force Requirements Section; and the Requirements process by Master Sgt. Phil LeMaitre. He noted that the briefing on Commercial Space Launch Requirements will be provided to the RLVWG by telecon. Mr. Wassel reported that the last item on the agenda was a discussion of the mission and objectives of the LOSWG.

Technology and Innovation Working Group (TIWG)

Lisa Hague, Senior Manager, Strategic Planning and Market Analysis, Boeing Launch Services, provided the TIWG report for COMSTAC member and TIWG Chair, Alex Liang. (Ms. Hague will serve as the Team Leader for the 2006 Commercial Geosynchronous Orbit Launch Demand Model). She described the methodology used for

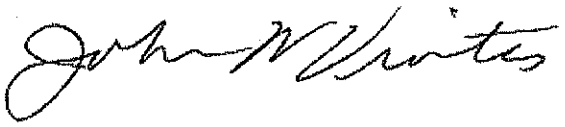
the preparation of the forecast, noting that it predicts commercial addressable [1] GEO satellites and launch vehicles out to10 years, and is broken down into four categories of satellite mass. She explained that satellite manufacturers and launch vehicle operators are asked to provide comprehensive input, i.e., market demand and satellite operators that provide individual inputs, i.e., their business plans and customer demands. She reported that the formal kick-off for the forecast will be in November with a letter to industry from the FAA Associate Administrator for Commercial Space Transportation; the forecast team is scheduled to meet in March; and a draft is expected to be ready and sent to Committee members for review in April.

She described the methodology of taking the projections from industry sources (satellite operators, manufacturers and launch service providers) and developing the long-term forecast, i.e., the last seven years of the 10-year forecast by averaging the comprehensive domestic forecasts by mass categories; and developing the near-term forecast, i.e., the first three years, by doing a bottoms up forecast of actual named opportunities (satellites already built and launches awarded).

New Business and Wrap Up

Patricia Smith, FAA Associate Administrator for Commercial Space Transportation introduced new AST employees and announced that COMSTAC member Debra Facktor Lepore was recently appointed as the President of Air Launch. Ms. Smith reported that Ms. Lepore will be responsible for the external activities of the Air Launch, including development and execution of the business and marketing plans and government relations.

Chairman Vinter asked all the working groups to examine certain issues, including ITAR, and the possible business impacts by India and China in the commercial launch arena. COMSTAC member Mike Kelly recommended a change from the term "reusable launch vehicle" to "spaceship" and proposed that the Committee consider changing the name of the RLVWG at the May 2006 meeting. Chairman Vinter stated that he would await a formal recommendation from Mr. Kelly. Since there was no additional new business, Mr. Vinter adjourned the meeting at 11:52 a.m.



John W. Vinter, Chairman, COMSTAC

[1] "Addressable" indicates those satellites that are open for internationally-competitive launch service procurements.

ATTENDEES

COMSTAC Members/Alternates

John Vinter, COMSTAC Chair, International Space Brokers, Inc.
Eleanor Aldrich, American Institute of Aeronautics and Astronautics
Louis Gomez, New Mexico Office of Space Commercialization
Livingston Holder, Holder Consulting Group
Frank L. Culbertson, Jr., Science Applications International Corporation
Frank A. DiBello, Florida Aerospace Finance Corporation
Edward Hikida, ATK Thiokol, Inc.
Michael Kelly, Northrup Grumman Corporation
David Keslow, Orbital Sciences Corporation
Christopher Kunstadter, United States Aviation Underwriters, Inc.
Debra F. Lepore, Kistler Aerospace Corporation
Robert H. Ragan, Bechtel Corporation
Dr. Billie Reed, Virginia Commercial Space Flight Authority
George T. Whitesides, National Space Society
Tim Hughes, Space Exploration Technologies (Alternate for Elon Musk)
Robert Bocek, The Boeing Company (Alternate for James Maser, Sea Launch Corporation)
Lisa Hague, The Boeing Company (Alternate for Dan Collins)
Elaine David, Lockheed Martin Corporation (Alternate for Mark Albrecht and Thomas Marsh)
Randall Clague, XCOR Aerospace (Alternate for Jeff Greason)

U.S. Department of Transportation
The Honorable Norman Y. Mineta, Secretary of Transportation

FAA Office of Commercial Space Transportation
Patricia G. Smith, Associate Administrator for Commercial Space Transportation
George Nield, Deputy Associate Administrator for Commercial Space Transportation