

Commercial Space Transportation Advisory Committee

May 14, 1998, Spring Meeting

MINUTES

COMSTAC Chair Ron Grabe, convened the meeting at 8:25 a.m. Mr. Grabe welcomed COMSTAC members and visitors and introduced four new COMSTAC members: Michael Kelly, President and Chief Executive Officer for Kelly Space and Technology, Inc., San Bernardino, California; Robert Cows, General Manager of Commercial Delta, Inc., McDonnell Douglas Division of The Boeing Company; Thomas Moyer, Director of the Governor's Fairbanks Office for the State of Alaska; and Bary Bertiger, Corporate Vice President and General Manager of the Satellite Communications Group for Motorola Space and Systems Technology Group.

Mr. Grabe announced that due to his increasingly busy schedule as Senior Vice President, Launch Systems Group at Orbital Sciences Corporation, he was resigning as Chair of the Committee. He then introduced and turned the committee over to the newly-appointed Chair, Mr. Steven Flajser, Vice President, Space Systems for Loral Space and Communications, Ltd. Mr. Grabe was presented with a plaque for his work as COMSTAC Chair by Manuel Vega, Acting Deputy Associate Administrator for Commercial Space Transportation.

REMARKS BY DEPUTY SECRETARY OF TRANSPORTATION

Mortimer Downey, Deputy Secretary of Transportation, presented remarks, focusing on the Administration's commitment to U.S. commercial space transportation leadership. Mr. Downey emphasized the importance of advanced technology to America's prosperity and national security and the Department of Transportation's (DOT) emphasis on research and development. He reported that over the last 5 years, DOT has invested over one billion dollars in technology development and deployment including such technologies as intelligent transportation systems and the development of Global Positioning Satellite-based systems for land, sea and air navigation.

Mr. Downey discussed the benefits of commercial space launch through services that result from satellites on orbit, and the increasing importance of the uses and services of the Global Positioning Satellite Systems. He also discussed DOT's efforts to develop effective partnerships with industry and with other Federal agencies including NASA and the Departments of Commerce and Defense to develop the next-generation of reusable and expendable launch technologies. Mr. Downey closed by reemphasizing the Administration's commitment to the U.S. commercial space transportation industry as outlined in the National Space Transportation Policy.

REPORT ON AST ACTIVITIES

Manuel Vega, Acting Deputy Associate Administrator for Commercial Space Transportation, provided a report on the activities of the Associate Administrator for Commercial Space

Transportation (AST), Federal Aviation Administration (FAA). He began by reporting on the status of AST's 3-phase regulatory initiative, noting that

Phase 1, which includes two proposed rules--one on financial responsibility and one on licensing launches from federal ranges--is nearing completion, and that the final rule on financial responsibility is under Departmental review and would soon be forwarded to OMB for interagency coordination. He stated that the rule for licensing launches from Federal ranges is currently in coordination within FAA and both rules are expected to be final and published in November 1998, if not sooner.

For Phase 2, Mr. Vega reported that the notice of proposed rulemaking (NPRM) dealing with non-federal launch sites (commercial spaceports) is expected to be published by December 1998 and the companion regulation for licensing launches from commercial spaceports is currently being drafted. For Phase 3, concerned with licensing reusable launch vehicles, he noted that AST is still pursuing the authority from Congress to regulate reentry operations, and in anticipation of the passage of that legislation, AST produced a technical issues memorandum which identifies areas impacting the safety of reentry operations.

Mr. Vega next discussed several activities in which AST is cooperating with the Air Force and/or NASA. These include:

- working with the Air Force on the handling of launch mishap investigations and disclosure of information;
- working as a cooperating agency with NASA on the X-33 RLV technology demonstration project;
- working as a cooperating agency with the Air Force on EELV development to ensure the consideration of commercial launch requirements; and
- working with the Air Force to review the Environment Impact Statement for the EELV project.

Mr. Vega reported on AST's continuing support for the Office of the U.S. Trade Representative during consultations with Russia, China and Ukraine regarding the respective commercial launch trade agreements; and that the primary concern regarding the agreements has been the issue of GEO launch quotas.

He also reported on licensed commercial launch activity for 1998. He noted that: 10 licensed launches have taken place with a total of 31 projected by the end of the year, establishing a new record; the first commercial launch of 1998 was Lockheed Martin's Athena II maiden flight carrying NASA's Lunar Prospector and also the first launch from a licensed commercial site, Spaceport Florida. He pointed out that this was the first use of Launch Complex 46 and a significant extension of NASA's use of commercial launch services. He congratulated the industry on a successful year.

Mr. Vega outlined FAA's 1998 Strategic Plan which focuses on three major goals: safety, security and system efficiency and that under the system efficiency goal, AST is leading an initiative to develop a national airspace management system which would integrate space and air

operations. He reported that the working council for this initiative met in April to discuss the impact of new commercial launch operations such as reentry and covered such issues as the proposed commercial launch site in Alaska, the X33 project, the status of reentry legislation, and the Cheap Access to Space Prize (CATS). He concluded by announcing the 2nd Annual Commercial Space Transportation Forecast Conference scheduled for February 9-10, 1999.

REPORT ON CURRENT DOD/INDUSTRY PARTNERSHIPS

Colonel Marc Johansen, Assistant Deputy Under Secretary of Defense for Space Acquisition and Management, presented a briefing entitled "*Crossroads and Intersections: Current DOD/Industry Partnerships.*" Col. Johansen discussed the changing environment for the U.S. space sectors, noting that the "majority stockholder" for space has changed from DOD to the U.S. commercial launch industry. He pointed out that this change has occurred because the commercial space program will have more launches than the national security program, will spend a large amount of money on advanced space technology, will greatly expand the number of communications satellites in orbit, and significantly increase the availability of commercial remote sensing images. He provided statistics for the Committee which showed an increase in commercial expenditures from 3 billion dollars in 1986 to 27 billion in 1996 with a forecast of 170 billion dollars in 2007.

Col. Johansen pointed out that DOD is partnering with industry for space services through increased use of LEO and GEO communications satellites, and various types of remote sensing satellites including electro-optical, synthetic aperture radar, and multispectral and hyperspectral imagery. He stated that DOD's major concerns with the increased use of commercial space systems are the use of commercial systems by an adversary and whether commercial space systems are robust enough to withstand a conflict.

LEGISLATIVE UPDATE

The legislative update for this meeting was provided by Representative Dave Weldon, Vice Chairman, Space and Aeronautics Subcommittee of the House Science Committee. Congressman Weldon began by reporting that the NASA Authorization Bill and the Commercial Space Act were passed by the Senate Commerce Committee on March 12th; however, both pieces of legislation were hung up due to the tobacco legislation. He also mentioned problems with the Technology Administration Bill and indemnification issues for the Space Station in the NASA Authorization Bill.

Congressman Weldon focused primarily on range modernization issues, describing the aging technology at U.S. launch ranges, specifically facilities in the XY Building at Cape Canaveral Air Station. He expressed concern that funds earmarked for the Air Force Range Standardization and Automation Program (RSA) have been used for other purposes such as military operations in Bosnia. He concluded by reporting that he had met with Curt Weldon (Chairman of the Subcommittee on Military Research and Development, House Science Committee), regarding these matters. He also reported that he was planning to offer an amendment to the DOD Authorization Bill, which would protect RSA funds from being used for other purposes.

REPORT ON RLV DEVELOPMENT POLICY

Mr. Michael Kelly, President and Chief Executive Officer for Kelly Space and Technology, Inc., provided a discussion of the major policy issues surrounding the development of reusable launch technology. He pointed out that reusable launch technology is not new technology, but technology which is more suited to a commercial environment in contrast to expendable launch technology which was designed to meet the needs of the Cold War. He also pointed out that among the various RLV proposals, the RLV "winner" would be determined by market forces.

Mr. Kelly identified the two main policy issues for RLV development as (1) the introduction of a new technical approach into a "mature" regulatory environment, and (2) the introduction of free enterprise into a "socialist" business environment. He described two types of regulatory hazards: government-generated which stifle experimentation through too many regulations, regulatory arbitrariness, and the lack of a coherent regulatory environment; and industry-generated wherein the ELV industry deliberately suppresses innovation through burdensome regulations and RLV companies fight among themselves.

Mr. Kelly stated that the regulatory environment is good for RLV development, especially as a result of the work by AST, and he recommended the support of the Commercial Space Launch Act and vigorous campaigning for an increase in the AST operating budget. He also recommended support of government purchase of launch services instead of launch vehicles, and that government-funded launch vehicles not be permitted to carry commercial spacecraft.

NATIONAL SPACE AND AIR TRAFFIC MANAGEMENT SYSTEM

Kelvin Coleman, Program Engineer in AST's Space Systems Development Division, provided the Committee with an overview of AST's initiative to develop the Space and Air Traffic Management System (SATMS). Mr. Coleman described SATMS as a concept that represents an expansion of the National Airspace System (NAS) to include commercial space launch operations and infrastructure as an integral component. He reported that AST is working on this initiative in conjunction with FAA's Air Traffic Services, and research for this initiative is being conducted by the Center of Excellence, a university consortium including University of California (Berkeley), Massachusetts Institute of Technology, University of Maryland, and Virginia Technical Institute.

Mr. Coleman reported that the NAS is currently undergoing a modernization process and AST is working to get commercial space transportation operations integrated into that process. He pointed out that such operations will be necessary in the future to integrate the number of commercial launches which are predicted, especially reusable launch vehicle operations, along with future aviation traffic which is currently operating at over 5,000 planes in the air at all times.

Mr. Coleman outlined a schedule for the work on this initiative: development of a preliminary SATMS operations concept (July 1998); a workshop for commercial launch providers, aviation industry and other stakeholders (August 1998); and the final product (September 1998). He stated that the objectives of the Concept of Operations would be to establish a framework for

managing aerospace and aviation traffic user needs, provide a guide for shaping technology investments and policy/procedures development, and outline a process for collaborative decision-making including space launch and site operators.

COMSTAC member, Louis Gomez, Program Manager for the Southwest Regional Spaceport, asked whether altitudes would be defined for where space begins in the proposed Space and Air Traffic Management System. He commented that the State of New Mexico has proposed legislation which would give a launch provider an exemption on their gross receipts tax if they reach at least 60,000 feet (the point where space begins).

LAUNCH ON DEMAND, PART II

Lieutenant Colonel Roger Odle from the Office of the DOD Space Architect, presented information on further developments in DOD's study of Launch on Demand (LOD) Impact. General Dickman, DOD Space Architect, who was also present, made some preliminary remarks about the study. (He had previously reported on the kick-off study at the October 23, 1997 COMSTAC meeting).

Lt. Col. Odle began by pointing out the definition of LOD as the time from an unscheduled launch call until the first usable service to the customer. He noted that the study assumed an LOD capability for the 2010-2020 time frame, focusing on the uses and utility of LOD and a determination of the changes necessary to enable LOD. He reported that among the three mission areas national security (DOD and intelligence sectors), commercial and civil, the national security and commercial would make the most use of LOD.

He identified seven functional areas: military utility, technology, systems, operations, law and policy, doctrine, and cost; and four major categories of potential uses: augmentation (improving performance by expanding existing capacity over the baseline), projection (use of space lift to transport materials), routine operations (initial population of constellation block upgrades), replenishment (replacement of failed or end-of-life of constellation satellites), and that for commercial purposes, the replenishment use was the most attractive.

Lt. Col. Odle reported that the study findings indicate that industry can expect that, over the next 10-15 years, most national security missions will be flown commercially; that some national security missions will be optimized for LOD because they will be light and low (<5K lbs to LEO) and will require focused technology and systems development; and that the policies and investments required for LOD will enhance routine space lift operations.

COMSTAC WORKING GROUP REPORTS

(Working Group meetings took place on Wednesday, May 13th)

Risk Management (Chaired by Rick Hauck, AXA Space Inc.). The Risk Management working group report was presented by Ms. Lynn Vollmer, AXA Space, Inc. for Mr. Hauck. She reported that the major concern of the working group is the continuation of the availability of indemnification for the U.S. launch industry under Public Law 85-804. She

reported that the working group is concerned that the commercial launch industry is being exposed to excessive and potentially uninsurable risks due to what they consider to be certain inconsistencies of coverage under PL 85-804 and the Commercial Space Launch Act, especially in relation to NASA-procured launches. She reported that the Risk Management working group wants the full Committee to recognize this issue and to ask the Secretary of Transportation for clarification of the commercial launch licensing process and to begin a dialogue with other agencies regarding this issue.

Technology and Innovation - (Chaired by Paul Fuller, Space Systems Services).

Mr. Henry Minami, The Boeing Company, provided the report of the Technology and Innovation working group for Mr. Fuller. He reported that the working group had two meetings with the Air Force's Evolved Expendable Launch Vehicle (EELV) Program Office (in November and December 1997), and provided the Air Force with market forecast information. He also reported that the working group had special discussions with the Air Force related to the EELV Request for Proposal which is scheduled to be released in the summer.

Mr. Minami next reported on the working group's task to review the issue of quotas under the 3 commercial launch international trade agreements (with Russia, China, and Ukraine), and that a survey was conducted of COMSTAC members regarding the appropriateness of quotas. He reported that from the members who were surveyed, 53% felt that quotas were appropriate.

Finally, Mr. Minami provided a summary of the 1998 update of the Commercial Spacecraft Mission Model, which was provided to the full Committee in draft, at the meeting. He reported that the 1998 report projects an average demand of 33 payloads per year for commercial spacecraft seeking GTO launch services during the period 1998-2010, showing a sizable reduction from last year's report (from 40 payloads to 29 payloads, a drop of 11 satellites). He noted that the reduction is attributed to a short-term response to the Asian economic crisis since the majority of the 11 payloads were for Asian launch opportunities. He also attributed the reduction to several other financing factors affecting the market.

Mr. Minami also noted that, as in the 1997 report, the forecast mass distribution of commercial payloads reflects a trend toward heavier satellites; that factors influencing the demand for heavier satellites include the availability of new heavy-lift launch vehicles, increased cost effectiveness of larger spacecraft, increasing spacecraft power requirements, larger antennae requirements, and increased orbital congestion; and that the 1998 report also includes a forecast based on the number of vehicle launches.

Launch Operations and Support - (Chaired by Bob Ragan, Bechtel Group, Inc.).

Bob Ragan reported that the Launch Operations and Support working group focused on the commercial launch frequency spectrum requirements. Mr. Ragan noted that at the working group meeting, a briefing was provided by Mr. Ruben Van Mitchell, Program

Analyst in AST's Space Systems Development Division, on FAA's study of the anticipated growth in commercial launch demand resulting in greater use of frequency spectrum and tracking, and telemetry and control facilities by commercial users. Mr. Ragan reported that the FAA study is looking at the potential changes in future demands for the 2,200 to 2,290 megahertz spectrum; the impact of shifting commercial telemetry operations to the 2,360-2,385 megahertz band; and the frequency management for commercial spaceports and mobile launch sites. He reported that his working group would be following this issue over the coming months.

LEO MARKET PROJECTIONS

Mr. Brett Alexander, Senior Policy Analyst, in AST's Space Systems Development Division, reported on the 1998 update of the Low Earth Orbit (LEO) Commercial Market Projections. He began by noting that the LEO report includes LEO, medium Earth orbit, elliptical orbit and other non-GEO orbits. He also noted that the report covers all commercial systems, and excludes U. S. government and foreign government payloads, except those foreign scientific payloads which are launched commercially. Finally, he reported that the report covers the same time frame (1998-2010) as the GEO Mission Model.

Mr. Alexander summarized the results of the report as:

Two market scenarios:

1. a baseline scenario consisting of 4 big LEO systems, 3 little LEO systems, and 2 broadband LEOs;
2. a robust scenario consisting 5 big LEO systems, 4 little LEO systems, and 3 broadband LEOs.

Payload projections:

Baseline Scenario: 1,202 payloads over 13 years .

Robust Scenario: 1,540 payloads over 13 years.

Launch demand:

Baseline scenario: 403 launches through the year 2010 (7-43 medium to heavy and 6-16 small launches per year).

Robust scenario: 498 launches through the year 2010 (7-45 medium to heavy and 6-21 small launches per year).

NEW BUSINESS AND WRAP UP

In response to Chairman Flajser's call for new business, a motion was made to establish a new working group for reusable launch vehicle issues and to have the working group chaired by new member, Mike Kelly. The motion was unanimously approved by the Committee. The meeting was adjourned at 1:18 p.m., subject to the call of the Chair.

Steven Flajser, Chairman, COMSTAC

ATTENDEES

COMSTAC Members

Steven J. Flajser, New Chair, Space Systems/Loral

Ronald J. Grabe, Outgoing Chair, Orbital Sciences Corporation

Eleanor Aldrich, AIAA

Robert J. Cows, The Boeing Company

Donald L. Cromer, Hughes Space and Communications

Patricia M. Fresh, MoonSpace

Emile Gardner, Gardner Consulting Planners

Louis Gomez, New Mexico Office of Space Commercialization

Livingston Holder, The Boeing Company

Michael Kelly, Kelly Space and Technology

Alex Liang, The Aerospace Corporation

Robert Ragan, The Bechtel Group

Alternates

Robert Martin for Bary Bertiger, Motorola

Lynn Vollmer for Rick Hauck, AXA Space, Inc.

Henry Minami (The Boeing Company) for Paul Fuller, Rocket Systems Services

Rich Scredon for Richard Hieb, AlliedSignal, Inc.

FAA/Associate Administrator for Commercial Space Transportation

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Brenda Parker

Ronald Gress

Herb Bachner

Stewart Jackson

Kelvin Coleman

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