

Commercial Space Transportation

QUARTERLY LAUNCH REPORT

Special Report:

Space Transportation Forecast
Conference, February 9-10, 1999



2nd Quarter 1999

United States Department of Transportation • Federal Aviation Administration
Associate Administrator for Commercial Space Transportation
800 Independence Ave. SW Room 331
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FAA's Second Annual Commercial Space Transportation Forecast Conference, February 9-10, 1999

OVERVIEW

The Federal Aviation Administration (FAA) hosted the second annual Commercial Space Transportation Forecast Conference on Tuesday, February 9th and Wednesday, February 10th, at the Washington Plaza Hotel, located in downtown Washington, DC. The conference featured four major addresses including the opening keynote address by Ms. Jane F. Garvey, FAA Administrator. Another major address was delivered by Dr. William Gaubatz, President, Space Clipper International, who presented an update of his concept of Spaceways, originally presented at the first Forecast Conference in 1998. Mr. Tidal McCoy, Chairman, Board of Directors for the Space Transportation Association was the guest speaker at the Conference Luncheon. Mr. McCoy provided a lively discussion on the need for the United States to achieve dominance in commercial space transportation and the vision necessary for this achievement. Dr. Marshall Kaplan, Chairman, Launchspace Publications, Inc., opened the second day of the conference with a presentation entitled "Basic Laws of Reusable Launch Vehicle Design."

The conference was officially opened by Patricia G. Smith, FAA Associate Administrator for Commercial Space Transportation. Ms. Smith welcomed participants and introduced Administrator Garvey. Ms. Garvey presented an overview of commercial space transportation developments occurring over 1998, including the one hundredth U.S.-licensed

commercial launch¹ and the FAA's newly-acquired authority to license reentry operations under the Commercial Space Launch Act of 1998. She highlighted the FAA's efforts to develop a Space and Air Traffic Management System (SATMS), a concept for the seamless and efficient integration of commercial launch operations into the existing air traffic management system. Ms. Garvey referred to the work on SATMS as developing the "commercial space transportation regulatory infrastructure of the 21st century," and noted that the FAA has organized a team of experts from Commercial Space Transportation, Air Traffic Services, and the Aircraft Certification Service to work on this important issue. Ms. Garvey also announced the initiation of a White House-led interagency review that will incorporate the views of FAA, NASA and the Air Force on critical space launch range issues. Ms. Garvey called conference participants "visionaries" and emphasized the FAA's commitment to commercial space transportation, safety for all commercial space transportation activities, and collaboration with industry and other organizations to ensure success for the industry.

Seven panels (discussed below) presented a cross-section of ideas and perspectives on the major issues facing the U.S. commercial space transportation industry. These panels covered a broad range of topics, from the FAA's role as regulator of the commercial

¹ The launch of an Iridium satellite on the Delta 7920-10 launch vehicle (Boeing), from Vandenberg AFB, on September 8, 1998.

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space industry, to the Air Force as it faces a change in its traditional role and responsibilities at U.S. launch ranges, and to the American people, who stand to reap tremendous benefits from the developments brought about by safe, successful, and economical space transportation in the 21st century.

The conference concluded with closing remarks from Mr. Joseph Hawkins, newly appointed Deputy Associate Administrator for Commercial Space Transportation.

PANEL 1: THE HUMAN ROLE IN SPACE

The first panel explored safety, medical, technology, and economic issues for humans traveling to space, whether for recreation, exploration, or work. For insight on actual experience in space, the panel included two American heroes: former Apollo astronauts Pete Conrad and Buzz Aldrin. Pete Conrad outlined some of the professional qualifications he felt would be required for future flights into space. Dr. Aldrin discussed his efforts to make space travel accessible to all people through his work with the Share Space Foundation. The Foundation examines ways to lower the costs of transport to space through various means, including the use of current NASA Shuttle technology for recreational and adventure travel.

Dr. Melchor Antuñano, President of the Aerospace Medical Association and representing the FAA's Office of Aviation Medicine, provided a fascinating examination of the vast number of medical issues that arise as a result of humans travelling to space, especially those who lack the level of physical fitness and training required for the rigors of an on-orbit environment, such as the typical tourist. He cited a number of risks, including

acceleration, solar and cosmic radiation exposure, the effects of weightlessness, in-flight exposure to noise and vibration, and other hazards.

Gary Hudson, Chief Executive Officer for the Rotary Rocket Company, rounded out the panel with his discussion of the development of the Roton reusable launch vehicle. He noted that the Roton will be the only commercial, orbital, piloted launch system in the world when it becomes operational in two years. Rotary Rocket is proposing the use of the Roton for carrying passengers into space for tourism.

PANEL 2: SPACE AND AIR TRAFFIC MANAGEMENT SYSTEM

The SATMS panel provided a discussion of the operational needs and requirements for a future National Airspace System that integrates all space launch traffic, including reentry operations. Panelist Michael Kelly, Chairman, Kelly Space and Technology, Inc., compared current launch vehicle operations with proposed reusable launch vehicle (RLV) operations, indicating his belief that future RLV activities would have very little negative impact on air traffic. Lt. General Roger DeKok, Deputy Chief of Staff for Plans and Programs, U.S. Air Force Headquarters, discussed the role of the Air Force in current air traffic management, including the scheduling of launches, collision avoidance for ascent, and tracking and cataloging manmade objects in space. General DeKok also discussed how the Air Force's role would change in future air traffic management operations. Finally, Ronald Morgan, Director of Air Traffic for the FAA, provided a comparison of current air traffic control services with those required for space transportation operations in the future, especially flight over populated areas and reentry.

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PANEL 3: CHANGING ROLES AND RESPONSIBILITIES AT U.S. LAUNCH RANGES

The third panel explored the ways that traditional roles and responsibilities at federal launch ranges will evolve as the commercial space industry grows and spaceports without Air Force safety oversight begin operations. This panel provided views from all of the major players--Air Force Space Command, the Eastern and Western ranges, commercial spaceport operators, and the launch services industry. Panelists included Major General Robert Hinson, Director of Operations, Air Force Space Command; Colonel Kenneth Cinal, Operations Group Commander, 30th Space Wing; Edward O'Connor, Executive Director, Florida Spaceport Authority; Robert Rhodus, Director, Engineering Operations, Lockheed Martin Astronautics; and Colonel Philip Benjamin, Commander, 45th Operations Group.

PANEL 4: FINANCIAL ISSUES IN SPACE

Several experts brought their perspectives on the financial risks and incentives in exploration, as well as their views on opportunities for doing business in space, to the fourth panel. Gregory Randolph, Vice President and Co-Head of the Structured Finance Group for Goldman, Sachs & Company, discussed various aspects of financing reusable launch services. He outlined the business risks for the RLV sector, described the current market environment, and predicted continued growth for RLV sector. Omar Jaffrey, a Merrill Lynch specialist in financing for the satellite industry sector, provided a market outlook for the satellite industry, also predicting growth for the RLV sector and a very dynamic year for satellite financing. For space insurance issues, David McKay,

Senior Vice President, U.S. Aviation Underwriters, provided an examination of the segment of the insurance market that provides the capacity for launch operations liability. Finally, Gale Schluter, Vice President and General Manager, Expendable Launch Systems, The Boeing Company, provided the industry perspective with a discussion of indemnification for expendable launch vehicle operations.

PANEL 5: THE LAW IN SPACE—A CASE STUDY

Four lawyers specializing in space law participated in a futuristic scenario that highlighted some of the legal issues that could arise over a collision in space. The hypothetical collision involved a reusable launch vehicle operated by a Japanese and British partnership and an unmanned launch vehicle carrying cargo from a space station located between the Earth and the Moon. The scenario was designed to explore the impact of the Outer Space Treaties and other aspects of domestic U. S. law on decision-making and planning for activities in space. The panelists were John Gantt, Partner, Mizrack & Gantt; Franceska Schroeder, Senior Associate, Winthrop, Stimson, Putnam & Roberts; William English, Special Counsel, Iridium LLC; and Pamela Meredith, Law Offices of Pamela Meredith.

PANEL 6: STATE AND PRIVATE INITIATIVES ON THE SPACE FRONT

The sixth panel featured state government officials and representatives from private and grass-roots organizations discussing the ways that these entities support and participate in the growth and development of the U.S. commercial space transportation sector. The Honorable Andrea Seastrand, Executive Director of the California Space and Technology Alliance (CSTA) and

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former member of Congress from California's 22nd District, represented state government. She discussed the development of a 21-step, three-year strategic plan to make California the leading state in space transportation, education, research, services, and manufacturing. Also representing state government support was James Pagliosotti, Director of Government Relations, Aerospace States Association (ASA). Mr. Pagliosotti talked about the work ASA is doing to support commercial space transportation activities at the state government level and the economic development that states are experiencing as a result of these activities. Two space advocacy organizations were also represented on this panel: Craig Dickman presented the goals and activities of Space Explorers, Inc., an organization which has developed a space education program designed specifically for the classroom; and Charles Miller, Chairman of ProSpace Citizens Space Lobby, discussed the efforts of this advocacy group to open the space frontier for all humans.

Launch System. Colonel Jose Boluda, Director for the Evolved Expendable Launch Vehicle (EELV), in the Air Force Program Executive Office for Space, discussed the Air Force program for EELV development and the methods that the Air Force proposes to reduce launch costs.

PANEL 7: ADVANCING LAUNCH TECHNOLOGY

The last panel featured industry and military experts who are working on the development of new and improved launch vehicle technology. Discussion focused on the ways in which these developments can further improve commercial transportation services. Jerry Rising, President, VentureStar, LLC, Lockheed Martin Corporation, talked about his vision for the development of X-33 and VentureStar and the technological advances associated with that effort. Steve Wurst, President, Space Access, LLC, discussed the actions Space Access is taking to bring about safer, more reliable, and cost-effective access to space through the development of the SA-1