

**Commercial Space Transportation Advisory Committee**  
**May 10, 2001**  
**MEETING MINUTES**

COMSTAC Chair, Livingston Holder, convened the meeting at 8:33 a.m., and welcomed COMSTAC members and guests. The first order of business was the announcement of Thursday, October 18, 2001, as the date for the next Committee meeting and Wednesday, October 17, 2001 for working group meetings. He then introduced four new Committees members, appointed by former Secretary of Transportation, Rodney Slater on November 28, 2000: Dr. Mae Jemison, President, The Jemison Group, Inc.; Dr. Mark J. Albrecht, President, International Launch Services; George Thomas Marsh, President for Denver Operations, Lockheed Martin Space Systems Company; and Janet Sadler, Senior Vice President for Redholm Underwriting Agents, Ltd., in London. Chairman Holder pointed out that Dr. Jemison holds the distinction of being the first African American female to travel to space and Ms. Sadler is the first international COMSTAC member in the history of the Committee. Chairman Holder also introduced Charles Hall, Manager, Air Traffic Systems, American Airlines, noting that He and Mr. Hall were part of a reciprocal arrangement whereby Mr. Hall would attend COMSTAC meetings to represent the aviation/airline industry and he (Chairman Holder) would attend meetings of the Air Traffic Procedures Advisory Committee (ATPAC), representing the space industry.

Mr. Holder acknowledged the work of Gary Goodwin, Director, Launch Services Contracts, Space Systems/Loral, as the lead for the work on the *2001 COMSTAC Commercial Geosynchronous Launch Demand Model*. He also acknowledged the presence of Henry Minami, (Marketing Manager, Propulsion Systems, The Boeing Company), who was standing in for COMSTAC member, Robert Cowsls (The Boeing Company).

**Report on AST Activities**

Patricia G. Smith, Associate Administrator for Commercial Space Transportation (AST) began her report by commenting that the recent flight of Dennis Tito aboard the Russian Soyuz rocket has paved the way for the next development in space tourism. Ms. Smith reported on AST staffing issues including recruiting efforts under way to increase the total staff size from 34 to 69; the loss of several staff members, including Carl Rappoport, who retired in January, and Nick Himaras, and Michael Etchart who have taken new positions; and the addition of several new employees including John Sloane and Amy Snyder in AST's Space Systems Development Division, and Michael Chan and Paul Wilde in AST's Licensing and Safety Division. She also announced the selection of Kelvin Coleman as her special assistant and the hiring of Hugh Cook as the Manager of the newly-established Systems Engineering and Training Division within AST.

Ms. Smith reported on the draft RLV Safety Approval Process document recently approved jointly by AST and FAA's Associate Administrator for Regulations and Certification, stating that the document is intended to guide the FAA and RLV companies in the steps needed to ensure that new launch vehicle technology, embodying both rocket and airplane operational characteristics, are properly evaluated and administered. She

also reported on her participation in the meeting of the International Working Group on Space Traffic Management, in Seville, Spain, in February, noting that the discussions centered around the need for improved global traffic management, the reduction of space traffic hazards, the need for a codified set of international rules of the road for space operations, the threat of orbital debris to the geostationary orbit, and the possibility of making greater use of disposal orbits for mitigation; and consultations under the Memoranda of Agreement between the Governments of the United States and the People's Republic of China regarding International Trade and Commercial Launch Services, held in Beijing also in February.

Ms. Smith discussed the continuing work on the implementation of the recommendations contained in the Interagency Report on the Future Management of U.S. Space Launch Bases and Ranges through efforts with the Department of Commerce to collect and communicate commercial requirements to the Air Force and working with the Air Force to develop common safety standards for commercially-licensed launch operations for Federal and non-Federal ranges. She noted that such standards not only ensure the same level of public safety at all facilities, but also allow a single vehicle configuration to meet both FAA licensing requirements and government launch requirements at Federal launch sites, reducing costs and duplication. She reported that a draft Memorandum of Agreement among the Air Force, Commerce and FAA would be released very soon and would include commercial input about the Air Force budget process for range planning.

#### **FAA Study on Liability and Risk Sharing**

Esta Rosenberg, Legal Counsel in FAA's Office of Chief Counsel, discussed the report on liability and risk sharing required by Congress in the Commercial Space Transportation Competitiveness Act of 2000, stating that the purpose of the report is to establish a clear record, a factual legal policy foundation for understanding the role that risk allocation plays in commercial space transportation, and that it may be used by Congress to determine whether future extensions for indemnification will be necessary. She stated that the report requires an examination of the efficacy and adequacy of the existing regime for the current fleet of expendable launch vehicles, proposed RLVs, and commercial spaceports, as well as an examination of the liability risk sharing regime of other space faring governments, and the appropriate legal standard to apply to commercial space transportation activities. She pointed out that FAA would be seeking a wide range of views on the issues.

Ms. Rosenberg reported that input was being collected through a public meeting held on April 25<sup>th</sup>, an FAA docket, and a virtual public meeting on the Internet. She also noted that the COMSTAC Risk Management working group, chaired by member John Vinter, was preparing a COMSTAC report on the issue of liability and risk sharing. From data and comments already collected, she noted that a common theme is that the current risk sharing regime is very effective.

#### **The Department of Defense Space (DOD) Commission**

Lt. Col. William Harding, Chief of Plans and Policy, Space and Nuclear Deterrence Directorate, reported on the (DOD) Space Commission. Col. Harding noted that the

Commission is a 13-member body, established under the 2000 National Defense Authorization Act to review the organization and management of space for national security purposes. He said that in the report, released on January 11, the Commission recommended that space receive National level attention through a senior interagency group within the National Security Council (NSC) and a Presidential Advisory Board to revise space policy; that space leadership levels should be increased by establishing positions such as an Under Secretary of Defense for Space, Information, and Intelligence and establishing an Office of Strategic Reconnaissance in DCI, to examine classified, leading edge technologies for future capability.

He noted that the Commission also recommended some major changes and realignments for the Air Force, including:

- The creation of 2 four-star positions for space, instead of the current single position with two functions (Commander in Chief (Space) under the U.S. Space Command and the CINC of NORAD);
- The realignment of the Space and Missile Center under Air Force Space Command (currently under Air Force Materiel Command);
- Raising the level of the Assistant Secretary of the Air Force for Space to the level of Undersecretary, who will also serve as the Director of the RNO;
- Establishing the Air Force as the lead for space.

Col. Harding pointed out other organizational changes as a result of the Commission recommendations and he identified four over-arching themes:

- Space will only receive priority as a top national security concern through specific guidance and direction from the very highest levels of the government;
- Given the certainties of eventual space conflict, the U.S. must develop the means now both to deter and to defend against hostile acts in and from space;
- Management and organizational changes recommended by the Commission establish a path to form the critical mass necessary to create a Space Corps or separate military Space Department should external events mandate the creation of these organizations in the future; and
- The U.S. must create a unique culture for space through focused career development, education and training within which space leaders for the future can be developed.

COMSTAC Chairman Holder asked which programs from the Army and Navy were so specific that they would not be transferred under the Air Force and would those programs which are transferred be staffed by Air Force personnel. Col. Harding replied that programs that require terminals would stay under the respective services such as terminals to receive MILSTAR data or those for GPS receivers.

### Legislative Update

Cathy Travis, Communications Director for Congressman Solomon Ortiz (R-TX) and Brian Wager, Legislative Assistant to Congressman Ken Calvert (R-CA) provided a legislative update on the proposed bipartisan bill, *INVEST in Space Now Act of 2001*, a bill introduced by Congressman Calvert and supported by Congressman Ortiz, which is

designed to reward private investors with a tax credit which would pass through start-up companies (to launch commercial payloads) to their investors. Ms. Travis stated that one of the messages that the initiative wants to get across is that the commercial space transportation industry is not a competitor with NASA and that there are enough commercial business ventures available. She explained that investors and qualifying companies would receive a tax credit at a certain percentage, the year that the investment is made, and the percentage would be modified for several years and would eventually expire. She reported that the draft version of the bill calls for a 10-year program at a cost of \$4.4 billion, giving as many companies as possible up to 10 years to take advantage of the credits. She also explained that to qualify, a company would need to demonstrate that their approach will develop a vehicle to reduce the launch costs significantly below current levels, they have a commercially viable business plan, and could raise a minimum amount of equity capital.

Brian Wagner explained that the original proposal for the tax credit bill was introduced last year by Congressman Merrill Cook of Utah, but it didn't receive any sponsorship since it was rushed through. He explained that several members of Congress, in addition to Mr. Ortiz and Mr. Calvert, have expressed interest in the bill, including Congressman Frank Lewis from Oklahoma and Congressman Mark Foley from Florida. He urged meeting attendees to send letters of support to Mr. Calvert and Mr. Ortiz, contact local representatives regarding the bill, and submit input and recommendations that would be positive to the bill.

In response to a question as to whether the bill would include financing for commercial spaceports, Mr. Wagner replied that it was designed strictly for reusable launch vehicle (RLV) companies. He was also asked whether the bill places the Department of Transportation in the position of picking losers by certifying that a particular approach might succeed. Mr. Wagner responded that they are drafting the bill so that the certification process is automatic once a company meets the required criteria and that there will be caps on how much a company can collect.

## **WORKING GROUP REPORTS**

### **Risk Management Working Group (RMWG)**

John Vinter, chair of the RMWG, reported on the COMSTAC preliminary report regarding the Commercial Space Transportation Competitiveness Act of 2000, enacted on November 1, 2000, which covers the financial responsibility regime, including indemnification, extended through 2004. He pointed out that the Act covers expendable, as well as, reusable launch vehicles, and requires that the licensee obtain liability insurance at no cost to the government, in an amount determined by the FAA, not to exceed \$500 million, based on an FAA maximum probable loss analysis. He pointed out that the indemnification is subject to appropriation, and the intent is for the government to indemnify for claims and excessive insurance up to 1.5 billion, adjusted for inflation. He said that Congress asked that seven areas be covered in the report on liability and he provided the preliminary findings for each of the areas:

- 1. Analyze the adequacy, propriety, and effectiveness of, and the need for, the current liability risk-sharing regime in the United States for commercial space transportation.**

Preliminary Findings: The current regime is adequate, proper, effective and necessary because it sustains and enhances competition; ensures financial responsibility and financial security; and is vital to U.S. national security. The current regime should not be replaced with or modified to look like a risk management plan for the airline industry because the commercial space launch industry is a high-risk, low volume business, while the commercial airline industry is a low-risk, high-volume business.

- 2. Examine the current liability and liability risk-sharing regimes in other countries with space transportation capabilities.**

Preliminary Findings: Western Europe-Arianespace offers a comprehensive cross-waiver scheme similar to the U.S., comprehensive insurance protection to customer and no cost to the customer, and indemnifies the launch customer against third-party claims that exceed the insured limits, not subject to appropriations. The People's Republic of China (the Long March) offers insurance protection in the amount of \$100 million (U.S.), with full indemnification for claims exceeding the liability insurance. Russia (Khrunichev) provides up to \$300 million of insurance protection against third-party claims and indemnifies the launch customer against third-party claims in excess of the amount of insurance. Japan provides 20 billion yen (U.S. \$64 million) of insurance against third-party claims, plus full indemnification. Australia's Government makes the MPL determination, setting amounts of required private insurance protection against third-party claims and claims in excess of the required insurance, payable by the government. All systems provide better protection than the U.S.

- 3. Examine the appropriateness of deeming all space transportation activities to be 'ultrahazardous activities' for which a strict liability standard may be applied and which liability regime should attach to space transportation activities, whether ultrahazardous activities or not.**

Preliminary Finding: It is not appropriate to deem, by legislation, all space transportation activities to be "ultrahazardous" to which a strict liability standard might be applied.

- 4. Examine the effect of relevant international treaties on the Federal Government's liability for commercial space launches and how the current domestic liability risk-sharing regime meets or exceeds the requirements of those treaties.**

Preliminary Findings: The Convention on International Liability for Damage Caused by Space Objects provides that the U.S. is liable to pay compensation for damage/injury caused by space objects (includes FAA licensed launches); the Commercial Space Launch Act requires the licensee to obtain insurance, in an amount determined by the USG, but not to exceed \$500 million, protecting the USG from property damage (up to

\$100 million) as well as third-party claims. The result is that the government receives assured protection in an amount specified by the U.S. treaty up to the limits of its calculated MPL. This scheme, therefore, does afford substantial and assured private financial protection to the government to meet its treaty obligations. It also puts the government in a position to control, through its licensing process, the nature and scope of the risk to the U.S. government that it assumes under the convention.

5. **Examine the appropriateness, as commercial RLVs enter service and demonstrate improved safety and reliability, of evolving the commercial space transportation liability regime towards the approach of the airline liability regime.**

Preliminary Findings: Future RLVs will operate more like conventional aircraft, with multiple launch and landing sites. The liability doctrines will be associated with air law.

6. **Examine the need for changes to the Federal Government's indemnification policy to accommodate the risks associated with commercial spaceport operations. No Preliminary Findings.**
7. **Recommend appropriate modifications to the commercial space transportation liability regime and the actions required to accomplish those modifications.**

Preliminary Findings: The primary weakness in the current regime is the unpredictability of the expiration date in the CSLA. The sunset provision is exploited by foreign competitors, such as Arianespace, who can claim better protection. The sunset provision should be deleted or the application for the indemnification provision extended for at least a 10 year period from the current expiration date.

#### **State of the Space Insurance Industry**

Mr. Vinter also provided a briefing on the state of the insurance industry for space, stating that the industry is doing reasonably well in spite of certain challenges, including more and less mature launchers coming on line, which are not easily insurable; bigger satellites being produced; more privatization and consolidations, and changing customers. He pointed out that all of these factors have caused rates to go up significantly in 1999 and 2000; that the space insurance and space market doesn't generate enough premium dollars to warrant a separate market, so that the premium dollars for space liability are going into the aviation market, which means that if there is an aviation problem, space liability insurance might be affected; and that 75% of the business is done in London.

For the launch and in-orbit insurance, Mr. Vinter noted that 25% of the business is in the U.S., the 2001 total market capacity is \$937 million (in U.S.); and the U.S. portion of that is \$261 million. He pointed out that actual launch capacity is estimated to be between \$450 million to \$500 million; that capacity must be "bought" above \$300 million; that in-orbit actual capacity is estimated to be between \$300 million to \$350 million; that during 1995-1997, underwriters made significant profits; that pressure on rates in 1998 caused

profitability to be down; that the Orion loss in 1999 dramatically increased rates; and that losses in 2000 exacerbated earlier problems.

He concluded that there is currently upward pressure on rates, lower capacity, tighter underwriting and technical requirements, a trend away from launch plus 5-year policy in favor of a launch plus 3-year policy; and that mandated ITAR compliance issues continue to impede progress. He added that lower numbers of launches are expected, new launchers will be starting operations, and the market will be very vulnerable to any additional large launch or in-orbit losses this year.

### **Technology and Innovation Working Group (TIWG)**

Henry Minami, (The Boeing Company), standing in for TIWG Chair, Bob Cowls, reported on activities since the October 2000 COMSTAC meeting. He discussed the steps used in collecting data for the 2001 Commercial Geosynchronous Launch Demand Model. He also reported on future activities of the TIWG, including a meeting with the Air Force EELV Special Project Office, scheduled for June, a meeting for U.S. government agencies to report on the 2001 market forecasts, scheduled for July. He also reported that the TIWG is considering a study on commercial launch supply and submitting inputs to the NASA and DOD Space Transportation Technology programs.

### **2001 Update: Commercial Geostationary Launch Demand Model**

Mr. Gary Goodwin, director of launch services contracts for Space Systems/Loral, served as Team Leader, for the 2001 forecast and reported on the development, the methodology, and the results of the 2001 GSO Launch Demand Model. He reported that the average annual spacecraft launch demand of 30.5 launches per year through 2010, was close to the 2000 forecast of 30.6; that the 2001 launch vehicle demand of 24.1 per year through 2010 is lower than near-term forecasts in the past. He pointed out the trends of continued growth in spacecraft mass (>5,445 kg) and new heavy-lift launchers entering the market, increasing number of dual payload launches because of the Ariane 5 and Delta-4.

He reported that the survey was sent to over 90 organizations, and received 27 responses, which were divided into two categories. The first category was comprised of spacecraft manufacturers and launch service providers, both international and domestic. The second category consisted of satellite services operators. The panel looked at addressable commercial payloads only, i.e., those that are internationally competed and open to U.S. launch providers, and excluding national payloads, i.e., military, civil, science.

He emphasized that there is a continued demand for lighter satellites and that there would probably be constant, the two extremes - light to heavy satellites- noting that the broadband or Ka-band business helps to drive the demand for heavier satellites.

### **2001 Commercial Space Transportation Projections for Non-Geosynchronous Orbits (NGSO)**

Herb Bachner, Manager, Space Systems Development Division, FAA/AST, reported on the 2001 NGSO Projections. He pointed out that the forecast period for the study is 2001

through 2010 and that the study is an assessment of commercial launch demand for all non-geosynchronous orbits (NGSO) including LEO, medium earth orbit (MEO), and elliptical orbits (ELI), and all commercial space systems including communications, remote sensing, foreign scientific payloads (launched commercially), and other systems, including digital audio radio. He noted that the market segments included in the study are: **Little LEOs** (narrowband data communications, e.g., e-mail, 2-way paging below 1 GHz); **Big LEOs** (and other mobile satellite services providing voice and data, operating in the 1-2 GHz frequency range); **Broadband LEOs** (high-bandwidth data links using Ku-band (12/17 GHz), Ka-band (17/30 GHz), V-band (36/45 GHz), and Q-band (46/56 GHz); **commercial remote sensing satellites** (encompassing a range of passive and active space-based sensors for earth observation data and imagery); and **foreign scientific and technical payloads** (for providing data on microgravity, life sciences, and communications experiments).

Mr. Bachner described the study methodology, compared the current study with the 2000 LEO projections, and summarized the results of the report. He noted the significant market decline due to ORBCOMM and Iridium bankruptcies, funding difficulties for new entrants, change of plans for ICO, competition with geosynchronous satellites, and competition with ground systems (fiber optics, digital cable, cellular telephones, and portable computers).

**Payload projections:**

**Baseline Scenario:** 151 payloads over 10 years (72.6% lower than the 552 projected last year for an 11-year period, 2000-2010).

**Robust Scenario:** 252 payloads over 10 years (63.2% lower than the 685 payloads projected last year for an 11-year period, 2000-2010).

**Launch demand:** (Assessed for two launch vehicle sizes: small <2,268 kg (5000 lb, 100 nm, 28.5°) and medium-to-heavy 2,268 kg (>5,000 lb, 185 nm, 28.5°).

**Baseline scenario:** 80 launches over 10 years; 1.5 medium-to-heavy launches and 6.5 small launches. (59% lower than last year's projection of 196).

**Robust scenario:** 104 launches over 10 years; 6.5 medium-to-heavy launches and 7.3 small launches. (61.8% lower than last year's projection of 272).

Mr. Bachner concluded that the number of NGSO satellites has slowed and no new systems have been deployed since 1999, except 3 satellites for Digital Radio; that funding is difficult to obtain due to loss of confidence by investors and competition for terrestrial and GEO services. He noted that companies are still planning new NGSO system deployment in the near future.

COMSTAC member, Dr. Alex Liang, inquired whether the proposal used for the supply-side model referred to the projected manufacturing total capability, what the companies planned to do, or what is on tap for the inventory? Mr. Minami replied that in doing the study, the group tried to utilize the same ground rules that were used for the demand and identify the response to the addressable market over the same planning horizon. He also noted that one of the assumptions is the identification of viable systems, their operational systems and their evolution.

#### **Reusable Launch Vehicle Working Group (RLVWG)**

Mike Kelly, RLVWG Chair, reported on the RLVWG meeting on Wednesday, May 9, which included a briefing on the outcome of a meeting to look at liability issues for space tourism; a NASA briefing on the status of the development of prototype flight safety systems; a discussion of the RLVWG comments regarding the Space Competitiveness Act, specifically the appropriateness of approaching Airline-Like Liability Regime in Terms of Governmental Liability Coverage Beyond a Certain Level; and a report on AST activities by Joe Hawkins, FAA/AST.

Mr. Kelly discussed the need to develop an alternative term for *reusable launch vehicle*. He also discussed the implications of Dennis Tito's recent space flight for the human space flight and the area of space tourism, noting that Mr. Tito's flight broke down barriers to people flying in space and proved that there is a market for space tourism. He stated his belief that the Tito flight will rank above the flight of Lindbergh, and could be compared to the plight of Bessie Coleman, the African-American female aviator, who had to go to France to learn to fly and receive an aviator's license, because she was denied that privilege in the United States.

He reported that the RLVWG will provide comments to AST on the Draft Guidebook for Safety Approval Process by June 30; convene a stakeholders meeting on the development of Advisory Circular for RLV Flight Testing; a submit suggestions for a new term to be used instead of "reusable launch vehicle."

#### **Launch Operations and Support Working Group (LOSWG)**

Stepheni Stephenson, United Space Alliance, reported on LOSWG activities and the meeting held on Wednesday, May 9<sup>th</sup>. She reported that the LOSWG had established a new safety subgroup, which would be a discussion group, providing input on potential NPRM requirements for the future. She noted that the group heard a presentation on FAA's potential follow-on requirements for GPS; a discussion on different launch requirements from FAA and Air Force perspectives, a presentation on the FAA NPRM on licensing requirements for launch and reentry, and a presentation on the development of an ongoing process to communicate commercial requirements in Air Force decisions. She added that the group also heard presentations on federal incentives, including the Spaceport Investment Act, the Zero Gravity, Zero Tax Act, the Invest in Space Now Act of 2001, and the Aerospace Corporation Model.

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### **FAA's NPRM on Licensing and Safety Requirements for Launch**

Micheal Dook, Project Engineer in the Licensing and Safety Division, FAA/AST, discussed the FAA NPRM on Licensing and Safety Requirements for Launch. He stated that the NPRM focuses on the operation of expendable launch vehicles and associated safety systems and processes currently in use, and attempts to capture the current practice at Federal ranges. He noted, however, that challenges arose in placing the current state of the industry and the current state of the FAA licensing process into the regulatory environment. He added that other challenges were the differences between the range safety process and the licensing process, trying to develop requirements that could be applied universally, and trying to build in flexibility to allow for future technology changes. He outlined the major industry comments and concerns:

#### **Competing safety requirements at federal ranges**

To address the industry concern about duplication of effort or conflicting requirements at Federal ranges, he pointed out that the NPRM has been an interagency effort among FAA, NASA, and the Air Force; that the FAA baseline assessments of the range safety process govern the safety of licensed launches; and the FAA and the Air Force have a Memorandum of Agreement for cooperation and coordination of launch safety, including the development of common safety standards.

#### **Lack of operational flexibility**

He noted that the NPRM builds flexibility into the licensing process, including establishing performance requirements at various levels, and clear and convincing demonstration of equivalent level of safety. To address the industry concern of oversight versus insight, he noted that FAA will use an insight approach.

#### **Detailed design standards**

He states that the NPRM provides both performance requirements and a road map which shows how each can be satisfied and identifies the intent behind the range safety requirements, both at the general level and in the detailed requirements.

#### **Additional requirements**

He reported that it was not FAA/AST's intent to include additional requirements, emphasizing that a majority of the safety requirements in the NPRM are based on current practice at federal ranges; however, the implementation may differ. He said that since the NPRM requirements cover a broad range of launch vehicles, launch sites and operational concepts, there was some confusion over the applicability of specific requirements.

#### **More conservative requirements**

He also noted that it was not FAA/AST's intent to use more conservative requirements; however some requirements had to be rewritten to include a universal approach.

#### **Should the FAA accept existing grandfathering and waivers on current launch vehicle systems**

He stated that this issue will be thoroughly considered for the final rule.

**Adverse cost impact**

He stated that since the NPRM captured current practices, there should be no significant cost impact.

In response to the industry concern that the NPRM created new licensee responsibilities, he noted that the responsibilities remain unchanged. He also reported that the Final Rule is scheduled to be published within 16 months of the close of the public comment period, i.e., August 23, 2002 and that AST would be participating in the new Safety subgroup under the Launch Operations and Support working group.

COMSTAC member, Lou Gomez, commented that the NPRM focuses mainly on the eastern and western launch ranges and expressed the desire that safety issues for inland spaceports be considered in the final rule. Mr. Dook responded that certain types of safety assessments have already been carried out regarding inland spaceports

**White House Space Issues Management Process**

Vic Villhard, Senior Space Analyst in the White House Office of Science and Technology Policy (OSTP), provided an overview of the Bush Administration's reorganization for space issues within the Executive Office. He reported that the Space Commission (discussed above) called for the creation of a senior interagency group under the National Security Council (NSC), which would coordinate national security, civil, and commercial space matters, adding that this group was established under National Security Policy Directive, Number 1, which lays out the structure of the NSC Policy Coordinating Committee (PCC). He noted that the NSC PCC is comprised of senior level representatives (usually Assistant Secretary or Deputy Assistant Secretary) from each of the departments and agencies involved in space matters (i.e., DOD, NASA, the Departments of Transportation, Commerce, and State, the intelligence community, the Joint Chiefs of Staff), as well as OSTP and the Office of Management and Budget (OMB).

Mr. Villhard explained that the PCC is further divided into sub-teams, led by the department or agency with the greatest equity in the subject area; e.g., the space transportation sub-team is co-led by NASA, DOD, and Transportation (FAA), noting that the NSA and OSTP serve as the executive secretary for each sub-team. He further explained that the co-leads for the sub-teams are responsible for developing the list of issues to be addressed, prioritizing the issues, implementing a process to resolve the issues, including development of an implementation plan by Fall 2001. He noted that the sub-team structure is a way to provide focused attention on the most significant programmatic and budgetary issues for space, and to resolve them quickly, adding that if issues are not resolved at the sub-team level, then they are elevated to the PCC level and higher if necessary.

Mr. Villhard next described the space transportation sub-team, set up to address the strategy for USG use of commercial space systems, international agreements, spectrum, and export controls and co-led by Patti Smith, Transportation; Chris Andrews for DOD,

and Karen Poniatowski for NASA. He said that the sub-team is currently examining agency responsibility established under the former administration, including DOD's responsibility to upgrade the ELV fleet and NASA's lead role in technology development and RLV development; and what the proper framework should be for replacing excess capacity construct, policy and law for launch base and range support to commercial launch providers.

Mr. Villhard concluded his remarks by stating that the Bush Administration recognizes the importance of space, not just to national security, but to economic well-being.

**Wrap Up**

Since there was no new business, the meeting was adjourned at 12:21 p.m., subject to the call of the Chair.



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Livingston L. Holder, Jr., Chairman, COMSTAC

**ATTENDEES****COMSTAC Members**

Livingston Holder, COMSTAC Chairman, The Boeing Company  
Mark Bitterman, Orbital Sciences Corporation  
Henry Minami, The Boeing Company (Alternate)  
Frank DiBello, SpaceVest  
Steven Flajser, Loral Space and Communications, Ltd.  
Louis Gomez, New Mexico Office of Space Commercialization  
Michael Kelly, Kelly Space & Technology, Inc.  
John Logsdon, George Washington University  
William Pickavance, United Space Alliance (Alternate)  
John Vinter, International Space Brokers  
Alex Liang, The Aerospace Corporation  
Gerald Musarra, Lockheed Martin (Alternate)  
Billie Reed, Virginia Commercial Space Flight Center  
Janet Sadler, Redholm Underwriting  
Roscoe Moore  
Mark Albrecht, International Launch Services