FOR IMMEDIATE RELEASE

Contact:
John Gedmark
202.349.1121

Commercial Spaceflight Federation Responds to Recent Aerospace Corporation White Paper on NASA's Commercial Crew Program

Washington, D.C., April 4, 2011 – The Commercial Spaceflight Federation released the following statement on the Aerospace Corporation's Space Launch Projects Group/Launch System Division's recent white paper on the business case of NASA's Commercial Crew Program, entitled "The Financial Feasibility and a Reliability Based Acquisition Approach for Commercial Crew":

NASA's Commercial Crew Program is a critical program for NASA's future, serving as the fastest way to regain an American capability to fly astronauts to the Space Station and resulting in significant savings to US taxpayers. While the Commercial Spaceflight Federation agrees with the Aerospace Corporation's Space Launch Projects Group on its recognition of the importance of commercial spaceflight to NASA, the Commercial Spaceflight Federation finds many of the model inputs, assumptions and assertions in the white paper to be incorrect or inaccurate, and strongly disagrees with the white paper's resulting conclusions.

As the authors of the white paper state, "The model and the results cannot validate the detail [sic] financials of any one commercial enterprise." Without appropriate inputs and assumptions, models cannot and should not be interpreted as generating real-world findings.

The white paper authors did not consult with industry in the course of their work, resulting in significant inaccuracies in the model inputs and assumptions. The white paper authors did not seek out real-world cost data, business case financials, or market assessments from potential commercial crew providers, such as United Launch Alliance, Sierra Nevada Corporation, SpaceX, Blue Origin, or others, nor did they contact the Commercial Spaceflight Federation. The white paper authors likewise did not consult any of the private investors who have invested hundreds of millions of dollars into the commercial spaceflight industry based on this proprietary information. As a result, many of the model inputs and assumptions used in the white paper are erroneous, contributing to conclusions that are incorrect and inaccurate.

The white paper primarily focuses on hypothetical spacecraft that are unlike those actually being developed. The white paper findings almost entirely revolve around the business case for spacecraft that have 4 seats, while most of the leading contenders for the Commercial Crew Program are developing vehicles with a capacity of 7 seats, including Boeing, SpaceX, and Sierra Nevada Corporation. For a given launch cost, a 7-seat capacity results in a significantly lower cost when compared with a 4-seat capacity.

The white paper assumes that commercial providers would sell seats to space tourists at a loss, but gives no explanation as to why a commercial business would sell its products or services at a loss. The commercial spaceflight industry categorically rejects this notion. Industry further rejects the white paper's additional notion that commercial providers would then increase rates to the government to subsidize that loss. The Commercial Spaceflight Federation strongly disagrees with any of the white paper's conclusions arising from these inexplicable assumptions.

The white paper ignores cases where sales of seats to other customers would actually decrease the per-seat cost to NASA. As one example, the white paper ignored the case where NASA purchases 4 seats on board a spacecraft that has a capacity of 7 seats. Should no other customers participate, those three seats would fly empty, and NASA would pay the full cost of the flight. However, if those empty seats are sold to other parties, the increased revenue from the flight could decrease the per-seat cost to NASA. Alternatively, the extra volume and payload mass could be sold to NASA as room for additional cargo, generating additional revenue.

The white paper assumes a large fixed cost of $400 million per year per company, but gives no basis for this number. This assumed fixed cost, which would be in addition to the marginal cost of a given flight, is a primary driver for many of the resulting findings of the white paper. Industry believes this number to be a significant over-estimate. By comparison, SpaceX's total expenditures over eight-and-a-half years as a company since it was founded are less than $800 million. That includes the cost of developing two new launch vehicles from scratch (Falcon 1 and Falcon 9), developing the Dragon spacecraft, conducting seven launches, including an orbital test flight of Dragon, and building out the infrastructure for two separate launch sites. It is highly unlikely that an additional $400 million per year in fixed costs would be required to conduct human spaceflight missions. The Aerospace Corporation typically uses cost models based on historical costs of government systems, and is not equipped to do cost analysis for commercially developed systems, such as with the NASA Commercial Crew and COTS Cargo development programs.

The large assumed fixed cost appears to include significant double counting. Launch vehicle fixed costs are distributed between all launch vehicle customers, including: DoD and intelligence community national security missions, NASA science missions, commercial satellite missions, NASA technology demo missions, and unmanned cargo missions. It is unclear if the white paper author's fixed-cost number accounts for these effects. In addition, this fixed-cost number is assumed to be a constant $400 million per company even when there are multiple winners, despite the fact that multiple winners may share launch vehicles, launch site infrastructure, training and medical facilities, recovery vessels, or other major components of fixed-cost estimates.

The white paper ignores the possibility of reductions in cost due to reusability. The Boeing CST-100, the SpaceX Dragon, and the Sierra Nevada Dream Chaser have all been explicitly designed to be reusable, which would result in a significant reduction in the marginal cost of each mission. The white paper made no effort to include this additional source of cost reductions.

The white paper ignores the "sovereign client" market entirely. The "sovereign client" market is well-established, and is defined as the sale of seats to other space agencies, other national governments, or similar entities. By some estimates, this market could be equal to or larger than the orbital space tourist market. Since 1978, the United States and Russia have flown almost 100 guest astronauts representing 30 countries, either in exchange for in-kind services or for payment. There remains significant pent-up demand for additional spaceflight missions within these countries, and almost 150 nations have never had a citizen fly in space. At least eight countries have active duty astronauts who have yet to fly in space and who are not currently manifested to fly on the Space Shuttle or Soyuz. An example of this international interest is represented by the work of Bigelow Aerospace, which has already signed a number of MOUs with national space agencies, government entities, and companies in a diverse array of countries including the United Arab Emirates, Japan, and the Netherlands.

The white paper likely underestimates the demand for orbital space tourism to a significant degree. According to at least one study (Futron Space Tourism Market Study, 2002), the white paper authors significantly underestimate the demand for space tourist seats. For example, the white paper assumes only 20 people in the world are willing to pay $30 million per seat. There are currently approximately 30,000 people in the world worth $100 million or more who could purchase such a ticket. Given that past experience shows people are willing to spend a significant fraction of their personal net worth in order to fly in space, such a minute market penetration seems unrealistic.

The white paper assumes a NASA demand of only 8 seats per year, which may significantly underestimate NASA's demand over the long term. By comparison, NASA's current demand for seats is approximately 40 seats to space per year, either through flights of the Space Shuttle or through Soyuz seat purchases. It is reasonable to expect that with a robust, cost-effective U.S. commercial crew capability with large seat capacities, the government may in the future seek to restore NASA's astronaut flights to 2010 levels in order to fully utilize the Space Station, to ensure a return on the $100 billion investment made in its construction, and to retain the national prestige that comes with having a vibrant astronaut corps.

The white paper ignores the potential for multiple winners to significantly keep development and operations costs low. The white paper does not model how competition in the market place would result in lower prices and work to prevent the significant cost overruns and schedule slips that have been the historic norm for government programs with a single winner. The virtuous cycle of increased demand from NASA and other governments that would then result from these lower costs is likewise not modeled.

The white paper underestimates the rate of price increases by the Soyuz. The white paper assumes Soyuz prices are increasing at the rate of 5% per year and will have an average price of only $70 million per seat over 10 years of operations. In reality, Soyuz prices have recently increased at the rate of 9-13% per year. Even at steady (linear) increases of seat prices, current increases indicate an average price over 10 years of $87 million, a price level 24% higher than the price assumed by the white paper.

The white paper refers to the EELV's as "government developed systems", yet these systems were in fact commercially developed under a program structured almost identically to COTS and Commercial Crew. The EELV's were developed using Other Transaction Authority (OTA) agreements, with a fixed investment by the U.S. Air Force supplemented by private investment in order to meet government requirements. Both EELVs, have had a distinguished record of success, with Atlas V having launched 24 of 24 flights successfully and Delta IV having launched 15 of 15 successfully.

In conclusion, any model that does not make use of appropriate assumptions or real-world data will be of limited use. Given that the commercial spaceflight industry finds many of the model inputs, assumptions and assertions in the white paper to be incorrect or inaccurate, no findings or conclusions from the white paper's analysis should be considered accurate or of significance in any real-world setting without significant further review and industry input.

About the Commercial Spaceflight Federation

The mission of the Commercial Spaceflight Federation (CSF) is to promote the development of commercial human spaceflight, pursue ever-higher levels of safety, and share best practices and expertise throughout the industry. The Commercial Spaceflight Federation's member companies, which include commercial spaceflight developers, operators, spaceports, suppliers, and service providers, are creating thousands of high-tech jobs nationwide, working to preserve American leadership in aerospace through technology innovation, and inspiring young people to pursue careers in science and engineering. For more information please visit www.commercialspaceflight.org or contact Executive Director John Gedmark at john@commercialspaceflight.org or at 202.349.1121.