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Congressional Hearing Notes
NASA's Commercial Crew Development Program: Accomplishments and Challenges

House Science, Space and Technology Committee
October 26, 2011

On October 26, 2011, the House Science, Space and Technology Committee held a hearing at which witnesses from five private sector companies involved in NASA's Commercial Crew Development (CCDev) program testified about the progress their companies are making. They were followed by NASA's Inspector General and NASA's Associate Administrator for Human Exploration and Operations. The following summary was originally published as an article on SpacePolicyOnline.com on October 27 under the title "Adequate Funding Key to Commercial Crew Timing."

The overriding message from government and private sector witnesses at yesterday's hearing on NASA's commercial crew program is that "adequate" funding will determine how quickly such systems can be ready to take astronauts to the International Space Station (ISS). The message from most members of the House Science, Space and Technology Committee in return is that they remain skeptical that there is a market for commercial crew services other than NASA to help defray the costs. Their concern is that the government will end up paying dearly for those services in addition to the billions of dollars it plans to invest in development costs.

The commercial crew program, initiated by President Obama in February 2010, is a public-private partnership where NASA and private sector companies share the costs of developing new crew transportation systems to low Earth orbit (LEO), including the ISS. The systems would be operated by the companies, not NASA. NASA would pay the companies to take astronauts to the ISS while the agency focuses on developing a new system to take astronauts further into space. With the termination of the space shuttle program earlier this year, NASA does not have the capability to launch anyone into space today. It pays Russia to take astronauts to the ISS.

The President's commercial crew proposal caught Congress by surprise last year and created significant controversy.

NASA requested $850 million for the commercial crew program in FY2012. The House Appropriations Committee approved $312 million, the same as FY2011. The Senate Appropriations Committee approved $500 million, the same level as recommended for FY2012 in the 2010 NASA Authorization Act. The recommendations have not been voted on by the House or Senate yet.

By Marcia S. Smith
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Those funds are to help the commercial companies develop their systems. NASA would pay separately for the crew transportation services the companies plan to offer. NASA's goal is to have at least two commercial crew providers from which to purchase services.

NASA Associate Administrator for Human Exploration and Operations Bill Gerstenmaier told the committee that if Congress provides the full $850 million request, commercial vehicles could be ferrying crews to the ISS by 2016. At the $500 million level, and assuming funding above projected levels for future years, the date would slip to 2017. During that year, he said, NASA would be paying Russia $480 million for crew transportation services, the implication being that the money would be better spent now on developing U.S systems.

In response to a comment from another committee member that 2017 seems like a long time to wait, committee chairman Ralph Hall (R-TX) agreed, arguing that someone needs to say "damn it, let's go."

Representatives of Boeing, Sierra Nevada and SpaceX all said their systems could be ready to go by 2015, but only if there is adequate funding. Boeing is working on the CST-100 spacecraft, which it plans to launch on a United Launch Alliance (ULA) Atlas V rocket. Sierra Nevada's Dream Chaser spacecraft also would use the Atlas V. SpaceX is developing its own rocket, Falcon 9, and spacecraft, Dragon. All three are receiving funding through NASA's Commercial Crew Development (CCDev) program. SpaceX also is one of two companies (along with Orbital Sciences) receiving NASA funds to develop a commercial cargo system, which was the subject of an earlier hearing.

ULA testified about the Atlas V, emphasizing its proven track record for uncrewed launches. George Sowers, ULA Vice President for Business Development and Advanced Programs, said it could be ready for test flights for commercial crew spacecraft in 2014 and operations in 2015. ULA also is receiving NASA funds through the CCDev program.

ATK wants to compete with ULA to launch commercial crew spacecraft. It is developing a new rocket, Liberty, using solid rockets originally developed for the space shuttle program that were being adapted for the now-canceled Constellation program, plus an upper stage from the European Ariane V rocket. ATK's Charlie Precourt, a former astronaut, said their concept required only a modest amount of NASA funding, but in order to get outside capital, "customer endorsement" of the project is required. ATK has an unfunded agreement with NASA to share data and information. It was not successful in getting a CCDev award because in the round of financing for which it applied (CCDev2), NASA funded only spacecraft and not launch vehicles, Precourt said.

Several committee members expressed concern about the overall cost to the taxpayer, which is a combination of the government's share of the development costs and payments for services once the systems are operating. Although many members have expressed reservations in the past about being reliant on another country for human access to space, the concern at this hearing was that it would cost much more for the commercial crew option than continuing to pay Russia. The United States is committed to using the ISS only until 2020. If the commercial systems are not ready until 2016 or 2017, their utility for ISS operations is limited. Committee members wanted to know if U.S. commercial systems would be competitive with Russia's prices if the development costs are included in the calculation.

Top committee Democrat Eddie Bernice Johnson (D-TX) and Rep. Donna Edwards (D-MD) each asked about a statement last week by NASA Deputy Administrator Lori Garver that NASA

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has an analysis showing that the agency needs to spend $6 billion over 5 years for development.

Rep. Edwards asked to see that analysis. NASA's Gerstenmaier said he could provide her with the basis for the estimate, which actually is a range from $4-6 billion, he said.

The cost for services once the systems are operational will be affected by how large of a non-NASA market exists for space tourism or other potential reasons for people to travel into LEO. NASA's Gerstenmaier confirmed that the agency needs only two flights a year of three astronauts each - six "seats." He expects to pay $80 million per seat, for a total of $480 million per year. The question is whether that is a sufficient market for companies to make an acceptable return on investment.

Boeing's John Elbon and Steve Lindsey of Sierra Nevada stressed that their companies are basing their business case on having only NASA as a customer. If there are additional customers, that would be a bonus.

Elon Musk, founder, Chief Executive Officer and Chief Technology Officer of SpaceX, took a different tack. He said that the goal of SpaceX is to "advance the cause of space ... not to maximize profit," adding that he retains majority ownership of SpaceX to "make sure the idealistic goals of SpaceX remain true." He told the committee that one advantage of his system is that the same spacecraft will be used for cargo and crew so he would be launching not just two crew flights per year using the Dragon spacecraft, but 6-8. In addition, he said his company has many flights booked for the Falcon 9 rocket, so the emergence of a non-government market for crew flights to low Earth orbit was not as critical a factor in his business plan. The Dragon spacecraft is being designed to carry seven people, and he said he was putting it on record that he would charge $20 million per seat in today's dollars - or $140 million per flight. He argued that is competitive with the $63 million per seat that he says Russia charges. (Russia's Soyuz spacecraft can accommodate only three people so the per flight costs are comparable.) Musk stressed, however, that if NASA wants to use a firm fixed price contract, then its requirements must also be fixed.

If Musk is correct and the costs are roughly the same as Russia's, that still would mean taxpayers would be investing $4-6 billion in development costs for systems that NASA would need for only 3-4 years of ISS operations. The Obama Administration has raised the possibility of extending ISS operations until 2028, 30 years after the first ISS module was launched, but the United States and its ISS partners (Russia, Europe, Japan and Canada) have not agreed to that extension.

Safety is another issue. All of the witnesses stressed that it is their top priority. Two of the company representatives -Lindsey of Sierra Nevada and Precourt of ATK - are former astronauts and were particularly emphatic in their statements on that point.

In his opening statement, Chairman Hall singled out one of CCDev winners, Blue Origin, for criticism for declining to testify at the hearing. The company has received $14.9 million so far in taxpayer dollars, he said, and would have to explain its decision not to appear.

- Hearing Charter
- Opening Statement by Chairman Ralph Hall (R-TX)
- Opening Statement by Ranking Member Eddie Bernice Johnson (D-TX)
- Written Statement of John Elbon, Boeing

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- Written Statement of Steve Lindsey, Sierra Nevada
- Written Statement of Elon Musk, SpaceX
- Written Statement of Charlie Precourt, ATK
- Written Statement of George Sowers, United Launch Alliance
- Written Statement of NASA Inspector General Paul Martin
- Written Statement of NASA AA for HEO, Bill Gerstenmaier
- Webcast

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