



Intelsat 35e mission. Photo courtesy SpaceX



Ground-breaking feats

Founded in 2002 by entrepreneur Elon Musk, SpaceX designs, manufactures and launches advanced rockets and spacecraft. The company's goal is to radically reduce space transportation costs and to make life multiplanetary. With the Falcon 9 and Dragon spacecraft family, SpaceX has achieved truly ground-breaking feats in spaceflight in recent years. Amy Saunders spoke with Jonathan Hofeller, Vice President of Commercial Sales at SpaceX, to learn more about how the company's recent accomplishments, market expectations, and plans for the future.

Question: Can you provide an overview of the key moments in SpaceX's history that have brought it to where it stands today?

Jonathan Hofeller: Since our founding in 2002, SpaceX has been able to achieve a number of key feats on the road to full and rapid reusability. In 2008, our first launch vehicle, Falcon 1, became the first privately developed liquid fuelled rocket to reach orbit. Two years later, Falcon 9 lifted-off for the first time and we successfully reached orbit with that vehicle as well. In 2012, our

Dragon spacecraft was the first commercial vehicle to dock with the International Space Station (ISS). Then, in late 2015, we successfully landed Falcon 9's boost stage for the first time at Cape Canaveral Air Force Station.

Just this year, we've accomplished two significant milestones that we're very proud of. First, in March, we successfully launched and landed the world's first flight-proven orbital class rocket. The success of that mission represented the culmination of years of effort from our engineers here at

SpaceX. A few months later, we successfully completed the first re-flight of a commercial spacecraft to the ISS, reusing a spacecraft that had resupplied the orbiting laboratory over a year earlier. We've now visited the ISS eleven times and launched Falcon 9 on 37 successful missions. We're very proud of our accomplishments to date and are working hard to continue providing reliable launch services to our customers.

Question: Where does SpaceX see itself in the spaceflight industry, and how does it differentiate itself from its satellite launch company competitors?

Jonathan Hofeller: We've captured our share of the launch market by providing competitively priced and reliable services to our customers worldwide. One of the ways that we've been successful is by offering services in each of the commercial, national security and civil launch sectors. Our diversified portfolio of launch customers across multiple market segments allows us to spread our fixed costs over multiple missions and provides a consistent income stream that's not entirely dependent on government budget cycles. Additionally, SpaceX



Jonathan Hofeller, Vice President of Commercial Sales at SpaceX



manufactures its launch vehicles in-house to keep strong control over quality, cost and efficiency.

Question: A wave of companies have announced plans for dedicated small satellite launch capabilities, putting pressure on traditional satellite launch companies. What do you think of this development, and the potential effects on SpaceX?

Jonathan Hofeller: We're big proponents of competition within the commercial space sector because it increases overall interest in space exploration and promotes rapid technological progress. That said, we're also confident that the most cost-effective option for small satellite owners to reach their desired orbit is to fly on multi-manifested Falcon 9 or Falcon Heavy flights.

Question: In September 2016, a Falcon 9 rocket loaded with satellite payloads exploded on the launch pad due to a fault with one of the composite overwrapped pressure vessels (COPVs). How has SpaceX recovered from this incident, and what effects has it had on the company?

Jonathan Hofeller: With the support of the FAA, the Air Force, NASA and the NTSB, SpaceX completed a rigorous investigation into the cause of last year's anomaly and has since taken corrective actions to address all of the credible causes. Our top goal coming out of the investigation was to safely and reliably return to flight for our customers, which we've been able to do.

Since our return to flight in January of this year, we've successfully

launched 10 missions – more than we have in any previous year – and are planning to increase our cadence as we head into the second half of the year.

Question: SpaceX made history in March 2017 when it achieved the world's first re-flight of an orbital class rocket for the launch of SES-10. What can you tell us about this achievement, and what does it mean for SpaceX going forwards?

Jonathan Hofeller: Successfully launching and landing a flight-proven booster for the first time was a testament to the years of work that our team has put towards the goal of reusability. It's our hope that continuing to launch and land flight-proven boosters will help convince the world that reusability is not only possible, but that it's key to being competitive in the future launch market.

Question: The Falcon Heavy launch vehicle, which will be the world's most powerful rocket, is due for its first demonstration flight later this year. Can you provide an outline of its development, and explain how the Falcon Heavy will benefit SpaceX as a company and the world at large?

Jonathan Hofeller: Falcon Heavy is a very exciting launch vehicle. When it launches later this year, Falcon Heavy

will be the most powerful vehicle to reach orbit since the Saturn V rocket that took astronauts to the moon. At five million pounds of lift-off thrust, it will have more than double the thrust of the next largest vehicle currently in operation.

Not only will Falcon Heavy be the most powerful operational rocket in the world by a factor of two, but thanks to the integrated design of our rockets, we are able to use flight-proven boosters for Falcon Heavy. In fact, the two side boosters on Falcon Heavy maiden flight, which we are on track to launch later this year, previously flew Falcon 9 missions. So, Falcon Heavy will leverage Falcon 9's proven heritage and reliability and allow larger payloads to access to the same economical launch services that we've provided for smaller payloads with the Falcon 9.

Question: The Dragon spacecraft made the news in 2012 when it became the first commercial spacecraft to deliver cargo the International Space Station (ISS), but it was also designed from the beginning to carry people. What can you tell us about the ongoing refinements to make the Dragon 2 a reality, and the plan to send two private citizens to the moon and back in 2018?



Photo courtesy SpaceX



Jonathan Hofeller: Our upgraded Dragon spacecraft, Dragon 2, will be utilized for both crew and cargo missions to the International Space Station as part of NASA's Cargo Resupply Service (CRS) and Commercial Crew Programs (CCP). The crew variant of Dragon 2 is capable of carrying a crew of up to seven to and beyond low Earth orbit and features an advanced environmental control and life support system (ECLSS), an emergency escape system, and the capability for autonomous flights to and from the ISS.

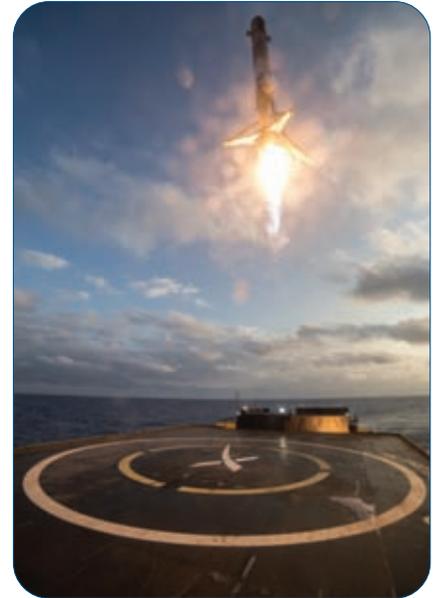
Through our partnerships with NASA's CRS and CCP programs, SpaceX will restore America's capability to deliver and return astronauts and significant amounts of cargo to and from the International Space Station.

Once operational Dragon 2

missions with crew are underway for NASA, SpaceX will fly two private individuals on a trip around the moon. Other flight teams have also expressed strong interest and we expect more to follow.

Question: What else do you expect SpaceX to achieve in the next couple of years?

Jonathan Hofeller: We have a number of exciting missions on the horizon, including the maiden flight of Falcon Heavy, launching NASA astronauts to the ISS from American soil for the first time since the Space Shuttle program was retired in 2011, and sending private citizens on a trip around the moon and to other destinations in Low Earth Orbit - all of which are important milestones towards our ultimate goal of transporting humans to Mars. ■



Orbital Test Vehicle 5 Mission. Photo courtesy SpaceX

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