ACS Science & the Congress Luncheon

Dr. Steve Davis
Director of Advanced Projects
Mission Success: 2008 – Present
Two Most Recent Mission Highlights

Became first privately owned company to send a spacecraft to supply cargo to the ISS

Primary objectives:
• Conduct a safe approach, berthing, cargo transfer, and cargo return to Earth
Commercial Crew

Since 2011, the United States has not had crew launch capability.

In August 2012, SpaceX was named by NASA as one of three companies to begin development of a new, American commercial crew spacecraft.
Commercial Model

Index of Prices of Personal Computers and Peripheral Equipment

Plummeting Cost of Solar PV
(Cost Per Watt in 2009 Dollars)

Flight Computer
Keys to Success

• **Design** – Increase reliability and decrease cost through simplicity, redundancy, and robust design margins
  – Stage count, engine commonality, horizontal integration

• **Evolutionary Approach** – Leverage commonality between vehicles
  – Falcon 1 to 9 to Heavy; Dragon Cargo to Dragon Crew

• **Flat Management Structure** – Senior management deeply involved in technical aspects of development, production and operations. Decision authority at the lowest possible level
  – Production and development under one roof; everyone, including Elon, in cubicles

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Reusability

Rockets must be fully and rapidly reusable, like an airplane

$500 per ticket
51,000 hours
2.5 million people

$60,000,000 per ticket
10 minutes
3 people
Grasshopper – Reusability & Affordability

• Vertical takeoff and landing (VTVL) test vehicle

• Comprised of a single Merlin 1D engine, a Falcon 9 first stage, and shock-absorbing landing legs

• Purpose: to test engineering concepts that will enable SpaceX to develop vehicles that are fully and rapidly reusable

• So far: Successful “hops” of approximately 6 feet, 17 feet, and 131 feet
Questions?