



# 3<sup>RD</sup> SPACE EXPLORATION CONFERENCE & EXHIBIT

## Commercial Crew & Cargo Program and COTS Status

Presenter: Alan Lindenmoyer

Title: Manager, Commercial Crew & Cargo Program

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# Program Objectives



- **The Commercial Crew & Cargo Program Office was established at the Johnson Space Center in 2005 to accomplish the following objectives:**
  - *Implement U.S. Space Exploration policy with investments to stimulate the commercial space industry*
  - *Facilitate U.S. private industry demonstration of cargo and crew space transportation capabilities with the goal of achieving safe, reliable, cost effective access to low-Earth orbit*
  - *Create a market environment in which commercial space transportation services are available to Government and private sector customers*

# Commercial Orbital Transportation Services (COTS)



- **COTS Project**
  - \$500M investment for demonstration of commercial orbital transportation capabilities
  - Paves the way for NASA to offer the ISS as a new market for U.S. commercial providers
- **SpaceX and Rocketplane Kistler (RpK) awarded funded Space Act Agreements in August 2006**
  - SpaceX has completed all milestones to date
  - RpK was unsuccessful in completing technical and financial milestones and was terminated in October 2007
- **Second round competition for \$170 million remaining balance of available funding completed February 19, 2008**
- **Orbital Sciences Corp. was selected as the new funded SAA COTS partner**

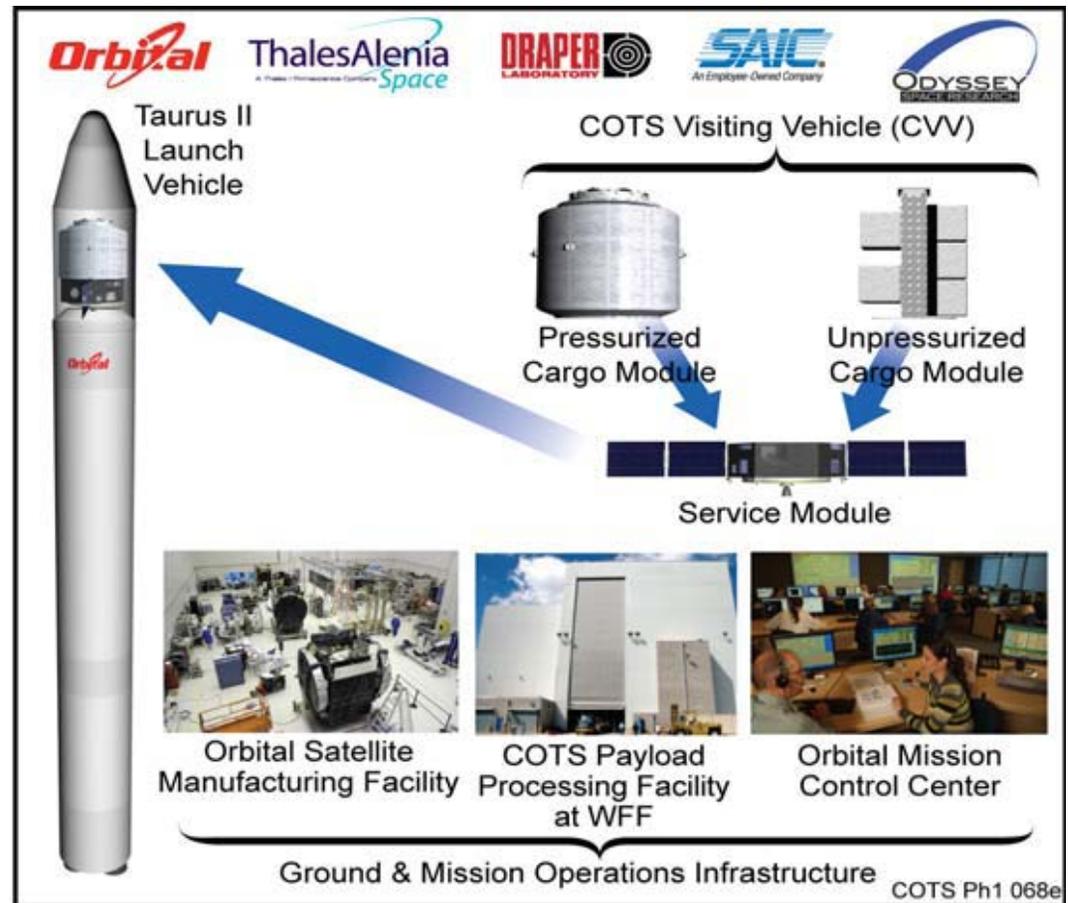


# Orbital COTS Project Summary



## Description & Features:

- **Taurus II Launch Vehicle -- 6 MT to ISS orbit**
  - 1<sup>st</sup> Stage: Lox/RP Aerojet AJ-26 engines (2)
  - 2<sup>nd</sup> Stage: Castor 30
- **Standard Service Module used for all missions**
  - Derived from STAR & Dawn spacecraft
- **Pressurized Cargo Module**
  - Derived from ISS MPLM
- **Unpressurized Cargo Module**
  - Derived from ISS EXPRESS Logistics Carrier



# Orbital SAA Performance Milestones



#	Description	Date
<b>FY08</b>		
1	Project Plan Review	Mar 08
2	Demo Mission SRR	Jun 08
3	Unpressurized Cargo Module PDR	Jul 08
4	Demo Mission PDR	Sep 08
<b>FY09</b>		
5	COTS Integration/Operations Facility Started	Oct 08
6	Pressurized Cargo Module PDR	Nov 08
7	Unpressurized Cargo Module CDR	Nov 08
8	IP&CL Delivery	Feb 09
9	Demo Mission CDR	Mar 08
10	COTS Visiting Vehicle Avionics Test	Jun 09
11	Unpressurized Cargo Module Fab Started	Jul 09
<b>FY09</b>		
12	Service Module Core Assembly Started	Oct 09
13	Service Module TRR	Jan 10
14	Service Module Initial Performance Test Complete	May 10
15	Launch Vehicle Stage 1 Assembly Complete	Sep 10
<b>FY10</b>		
16	Mission Readiness Review	Oct 10
17	Demo Flight	Dec 10

# SpaceX Recent Progress



- **Completed Falcon 9 1<sup>st</sup> stage tank qualification**
- **Completed first multi-engine test**
- **Continued launch site preparations at CCAFS**
  - **Demolition of tower at LC-40**



SpaceX Falcon 9 First Stage Two Engine Test, Jan 18, 2008 Video

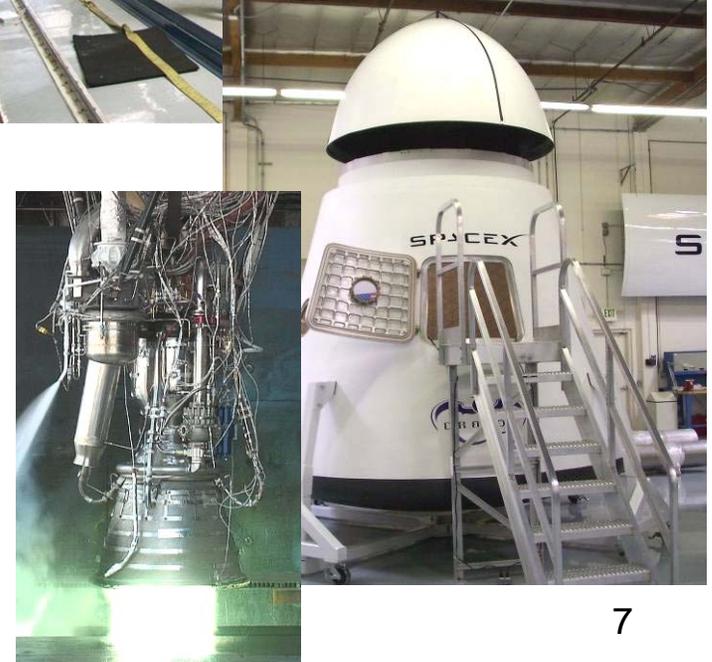


SpaceX SLC 40 Tower Demolition

# SpaceX Milestone Highlights



- **FY06**
  - Program Management Plan/Kickoff ✓ *Completed*
- **FY07**
  - System Requirements Reviews ✓ *Completed*
  - Preliminary Design Review ✓ *Completed*
  - Financing Round ✓ *Completed*
  - Critical Design Review ✓ *Completed*
- **FY08**
  - Δ System Requirements Review ✓ *Completed*
  - Δ Preliminary Design Review ✓ *Completed*
  - Demo 1 Readiness Review
  - Financing Round
  - Δ Design Reviews
  - Orbital Test Flight 1
- **FY09**
  - Demo 2/3 Readiness Reviews
  - Orbital Test Flight 2
  - Orbital Demonstration Mission to ISS



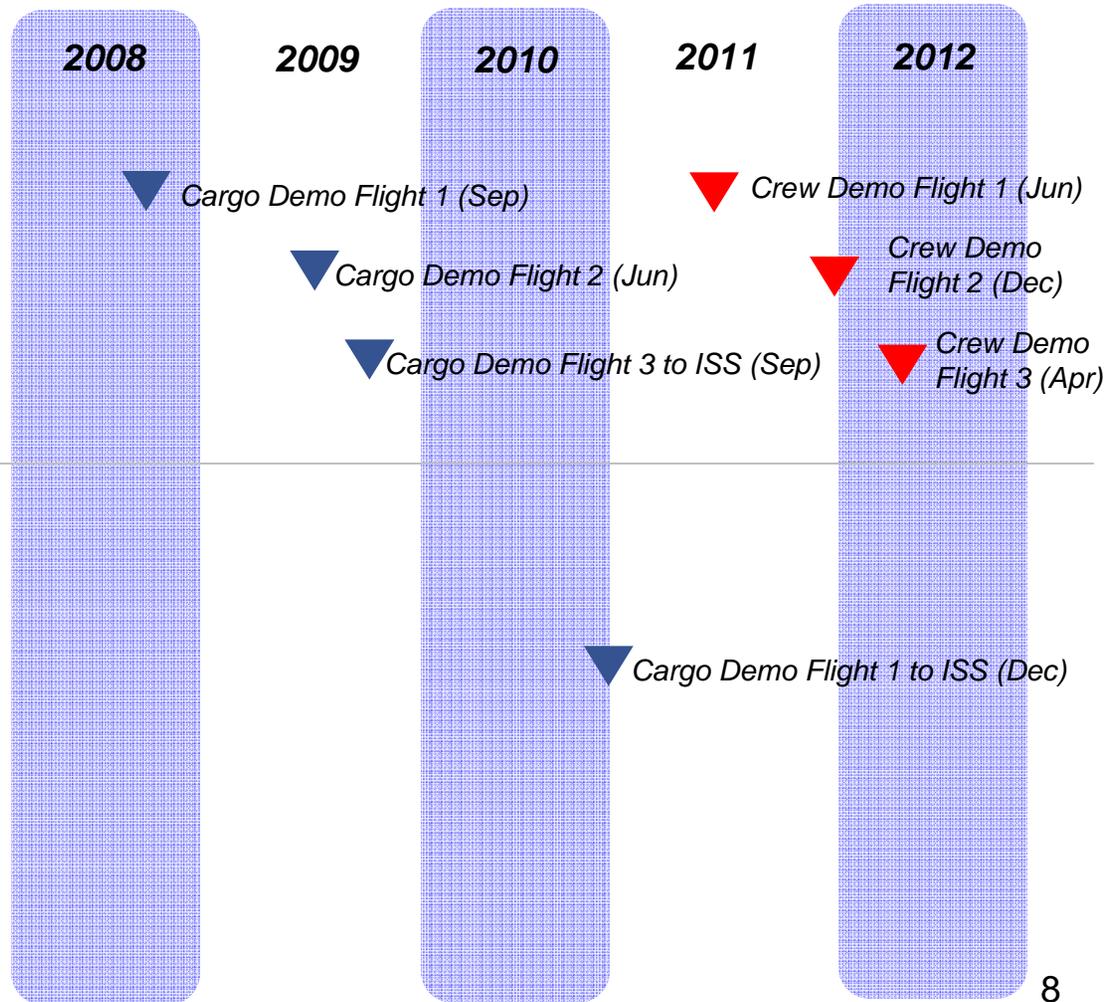
# COTS Flight Demonstration Schedule



**SPACEX**

**Orbital**

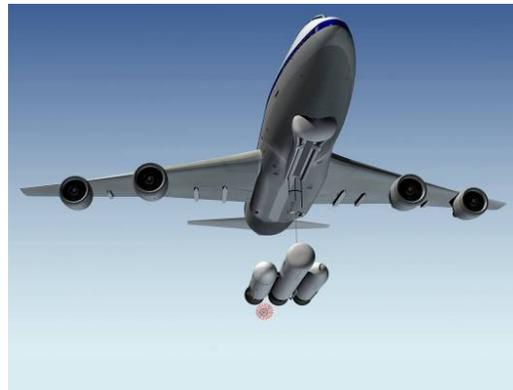
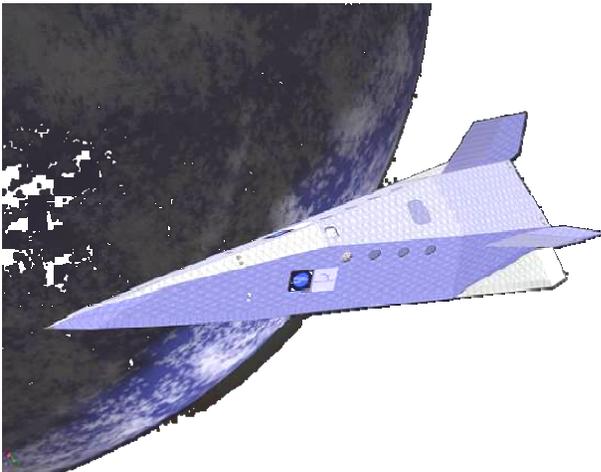
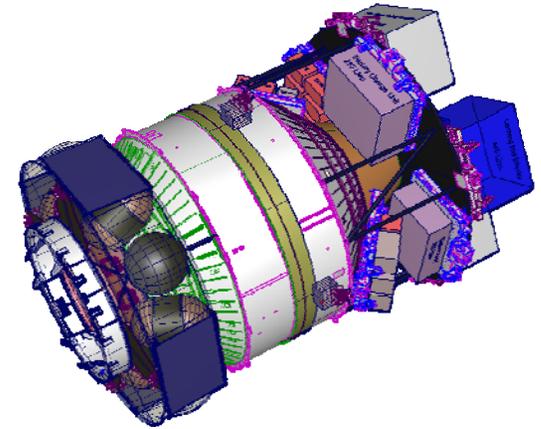
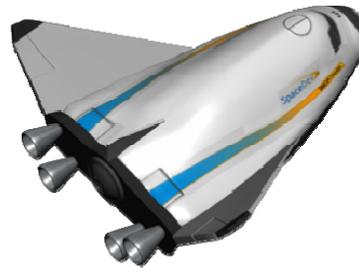
- ▼ Funded Milestone
- ▼ Optional Milestone



# Other Commercial Partners



- **NASA continues to support our unfunded SAA commercial partners**
  - Constellation Services International
  - PlanetSpace
  - SpaceDev
  - SPACEHAB
  - t/Space



A New Era In Spaceflight Is Beginning...



COMMERCIAL  
CREW & CARGO

