



CCiCap Announcement Summary Base Period Content

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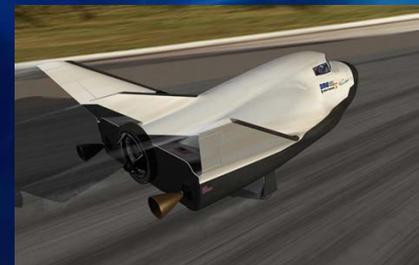
➤ Descriptions & Features

- Dream Chaser spacecraft is a reusable, piloted, lifting body, derived from NASA HL-20 concept
 - Carries up to 7 crew members
 - Utilizes non-toxic propellants
 - Primary Launch Site: Cape Canaveral, Florida
 - Primary Landing Site: Shuttle Landing Facility, Florida
 - Abort scenario leverages primary propulsion system with an ability to abort to a runway landing
- Atlas V vehicle launched from the Space Launch Complex 41 launch pad



➤ Base Period

- \$212.5M total NASA funding for 9 milestones
- Significant progress toward completion of critical design
- Two major safety reviews and significant subsystem technology maturation and hardware testing



Sierra Nevada Corporation



➤ Base Period Details (Key Milestones)

- Design and Development:
 - ♦ Program Implementation
 - ♦ Integrated System Baseline Review
 - ♦ Two Integrated System Safety Analysis
 - ♦ Certification Plan

- Testing:
 - ♦ Engineering Test Article Flight(s)
 - ♦ Wind Tunnel Risk Reduction
 - ♦ Spacecraft Subsystem Risk Reduction
 - ♦ Main Propulsion Risk Reduction
 - ♦ Reaction Control System Risk Reduction

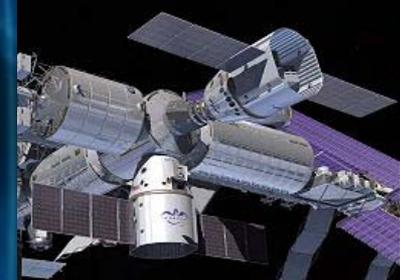


Space Exploration Technologies Corporation



➤ Descriptions & Features

- Spacecraft uses a crewed version of the SpaceX Dragon capsule
 - Carries up to 7 Crew
 - Primary Launch Site: Cape Canaveral, Florida
 - Primary Landing Site: “On land” landing, specific landing site in work
 - Integrated, side-mounted launch abort system utilizing SuperDraco engines
- Upgraded Falcon 9 vehicle launched from the Space Launch Complex 40 launch pad
- Mid calendar year 2015 crewed test flight (dependent on funding and technical progress)



Artist rendition of Dragon attached to ISS

➤ Base Period

- \$440M total NASA funding for 14 milestones
- Culminates in an integrated critical design review milestone
- Includes a pad abort test and an in-flight abort test



Picture of Falcon 9 rocket on launch pad in Florida



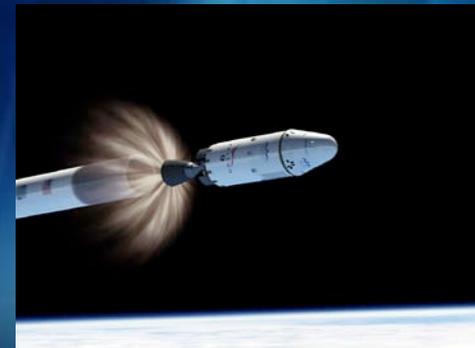
Artist rendition of Dragon re-entering Earth's atmosphere

Space Exploration Technologies



- **Base Period Details (Key Milestones)**

- Design and Development:
 - Integrated System Requirements Review
 - Ground Systems & Ascent Preliminary Design Review
 - Test Reviews for Pad Abort & In-Flight Abort
 - Human Certification Plan Review
 - On-Orbit & Entry Preliminary Design Review
 - Safety Review
 - Flight Review of Upgraded Falcon 9
 - Integrated Critical Design Review
- Testing:
 - Dragon Primary Structure Qualification
- Flight tests:
 - Pad Abort (SLC 40 and last quarter of 2013)
 - In-Flight Abort (SLC 40 and 2nd quarter of 2014)



The Boeing Company



➤ Descriptions & Features

- CST-100 spacecraft is a reusable capsule design utilizing many proven flight components
 - Carries up to 7 people
 - Primary Launch Site: Cape Canaveral, Florida
 - Primary Landing Site: “On Land” landing, specific landing site in work
 - “Pusher” launch abort system
- Atlas V launch vehicle using the dual engine Centaur upper stage configuration and launched from the Space Launch Complex 41 launch pad
- Late calendar year 2016 crewed test flight (dependent on funding and technical progress)



Artist rendition of the CST-100 spacecraft

➤ Base period

- \$460M total NASA funding for 19 milestones
- Culminates in an integrated critical design review milestone
- Significant propulsion system, avionics, and wind tunnel development and testing



Artist rendition of CST-100 and Atlas V on the launch pad



Successful parachute drop test accomplished during CCDev2

The Boeing Company



➤ Base Period Details (Key Milestones)

- Design and Development:
 - ♦ Integrated System Review
 - ♦ Production Design
 - ♦ Phase 1 Safety Review Board
 - ♦ Landing & Recovery / Ground Communication Design
 - ♦ Launch Vehicle Adapter Design
 - ♦ Certification Plan Review
 - ♦ SW Critical Design Review
 - ♦ System Critical Design Review

- Testing:
 - ♦ Integrated Stack Force & Moment Wind Tunnel
 - ♦ Dual Engine Centaur Development
 - ♦ Orbital Maneuvering & Attitude Control Engine Development
 - ♦ Mission Control Center Interface Demonstration
 - ♦ Emergency Detection System Standalone
 - ♦ Avionics SW Integration Lab Multi-String Demonstration
 - ♦ Pilot-in-the-Loop Demonstration





COMMERCIAL
CREW
PROGRAM





CCP All Hands

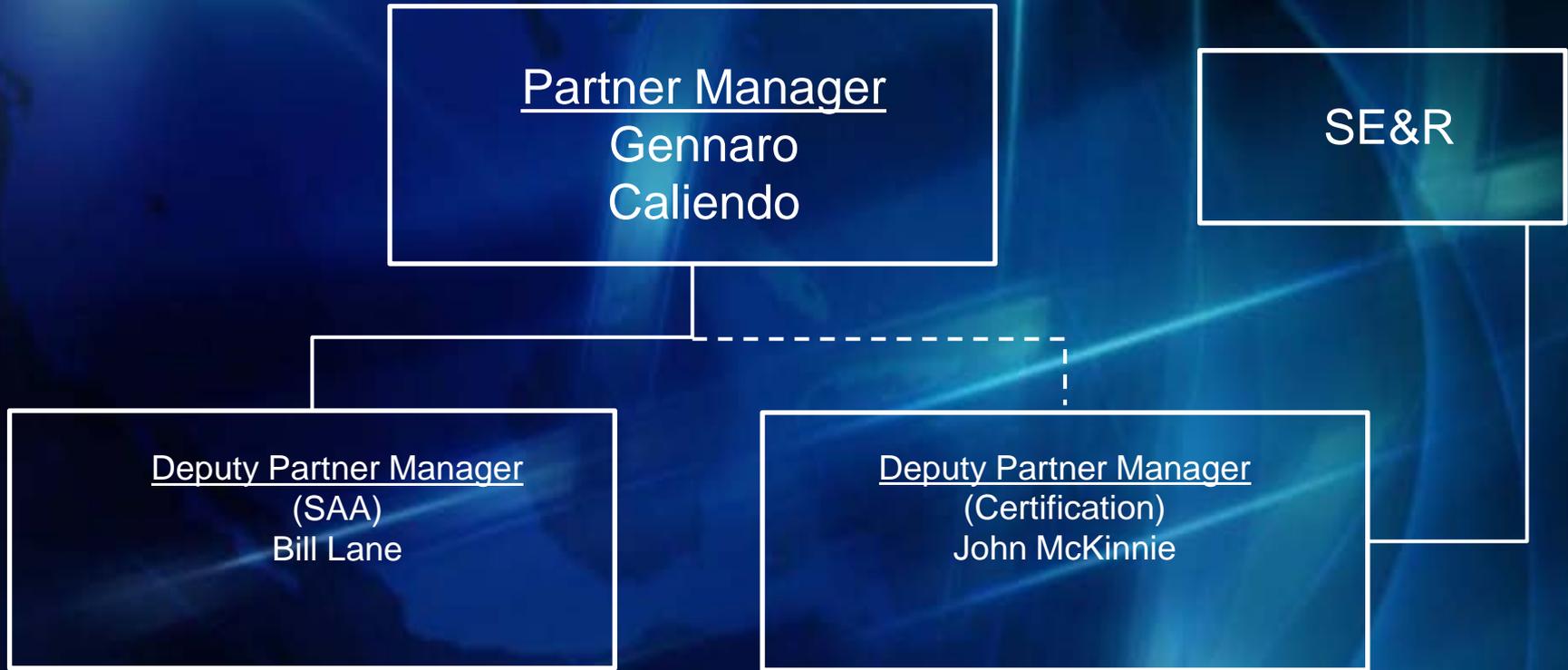
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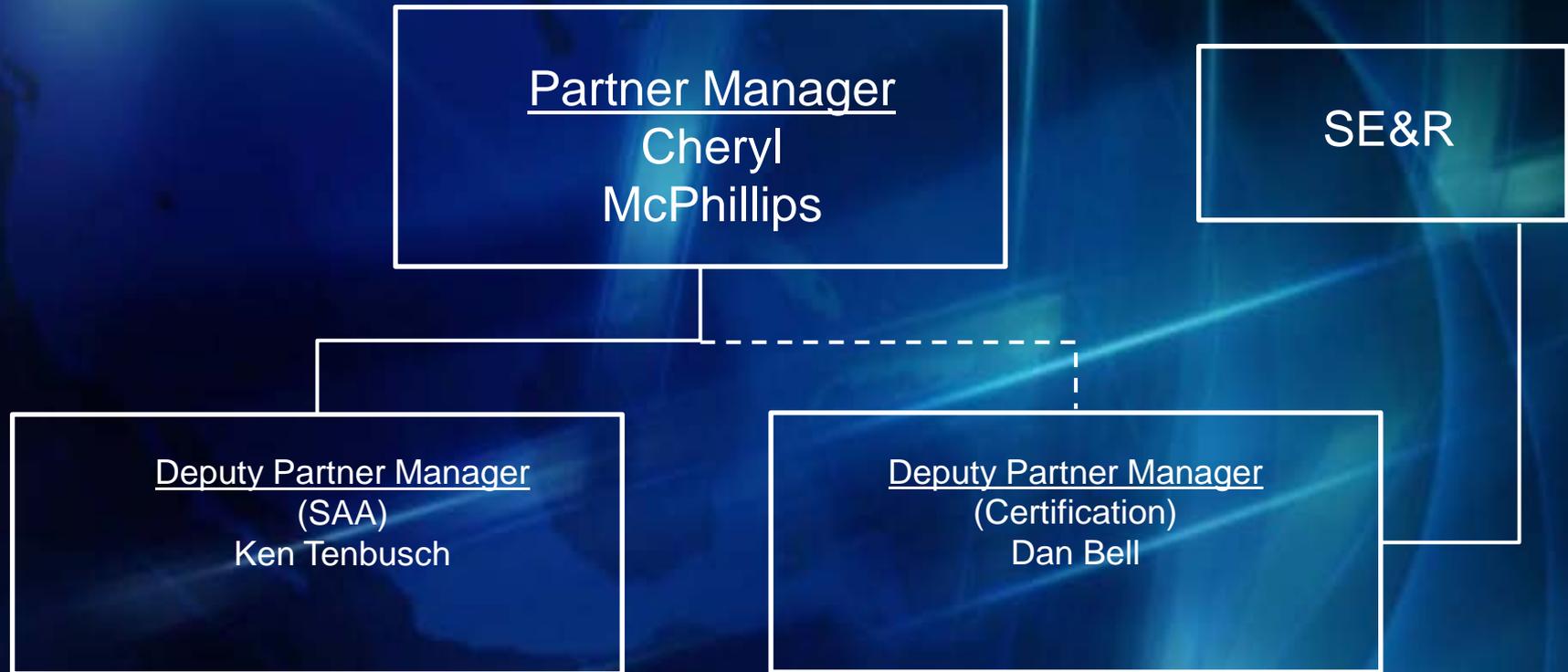
Commercial Crew Program

August 6, 2012

Boeing Partner Integration Team



Sierra Nevada Partner Integration Team



SpaceX Partner Integration Team

