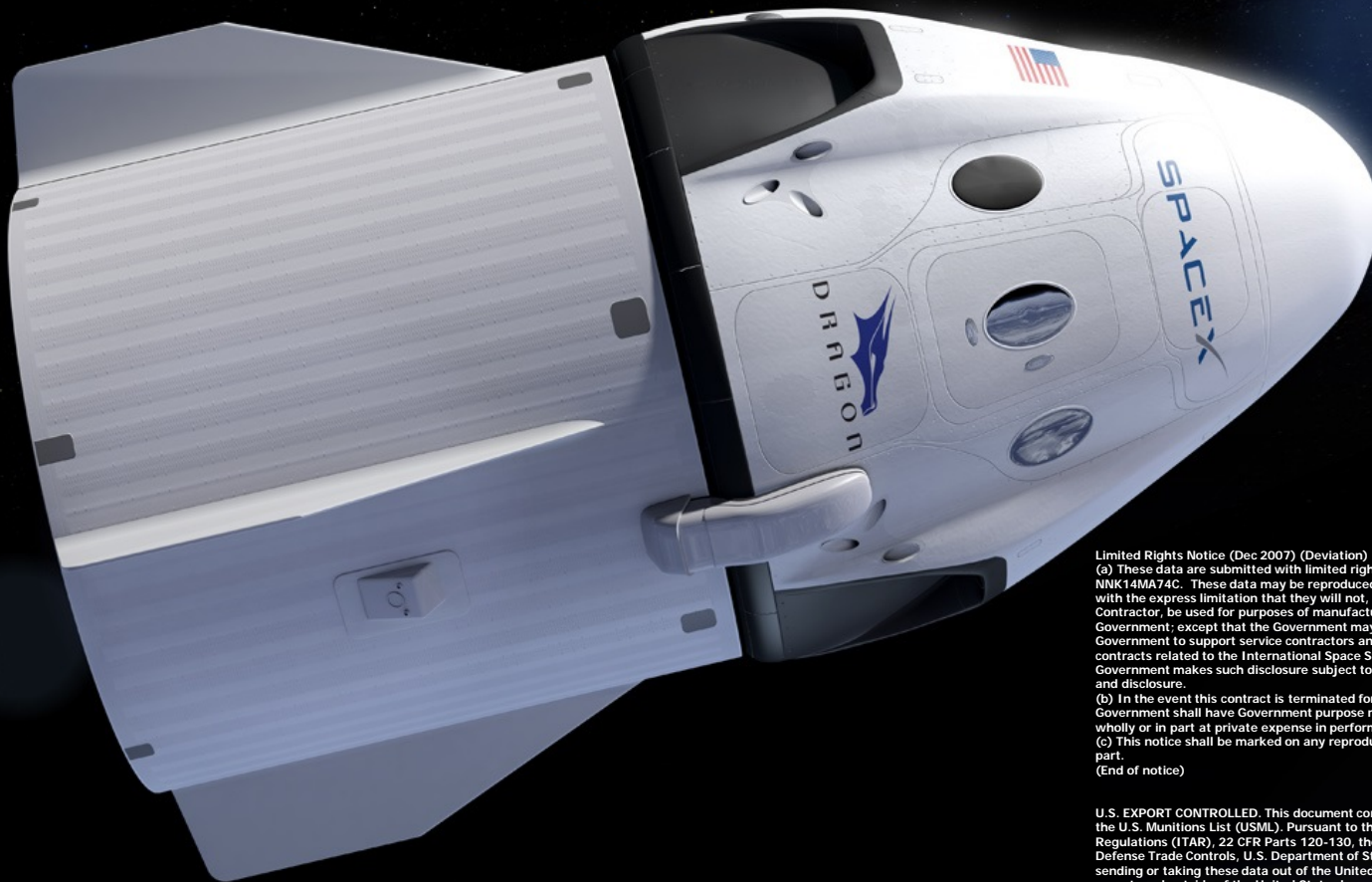


SPACEX



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Commercial Crew: Progress Toward Flights

October 2016, ISPCS | Benjamin Reed, Director of Crew Mission Management

Crew Program Overview

- SpaceX is developing a safe, reliable and complete Crew Transportation System certified to fly humans
- All key elements will be certified for crew, including Dragon, Falcon 9, ground systems, and all operations (Ground, Launch, Mission, Crew, and Recovery)
- Crew Dragon has SuperDraco thrusters for safety aborts and for propulsive landing
- Upcoming Crew Missions:
 - ✓ Demonstration 1 to International Space Station (ISS) without crew
 - ✓ In-Flight Abort Test
 - ✓ Demonstration 2 to ISS with crew
 - ✓ Multiple ongoing operational missions



Crew/Cargo System Architecture

- Spacecraft Segment (Dragon)
 - Crew Module, Service Section and Trunk
 - Launch Abort System (internally integrated into Dragon)
- Launch Segment (F9)
 - Merlin engines
 - LOX & RP-1 propellants
 - Landing legs (stowed in ascent)
- Ground and Operation Segment
 - Ground Systems
 - Launch Pad (LC-39A), Launch Pad facility, Ground software, ground communications & Launch Control Center
 - Operations System
 - Mission Control Center, Crew Operations, Training & Simulations, & Recovery



Crew Dragon Vehicle



Falcon 9



Mission Control in Hawthorne, CA



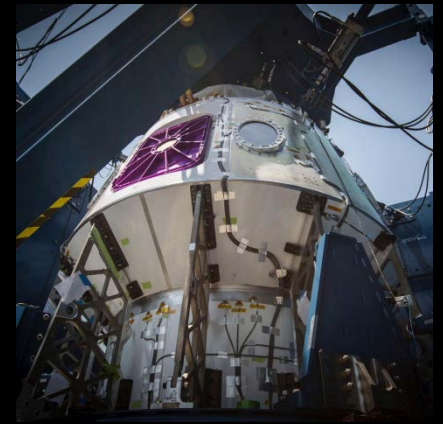
Launch Control Cape Canaveral, FL



LC-39 Cape Canaveral, FL

Recent

- Parachute Testing
- Capsule Qualification
- Propulsive Landing Testing
- Design closeouts
- Production & Test
- IDA Delivery
- Post-Certification Missions



Parachute Drop Test Video

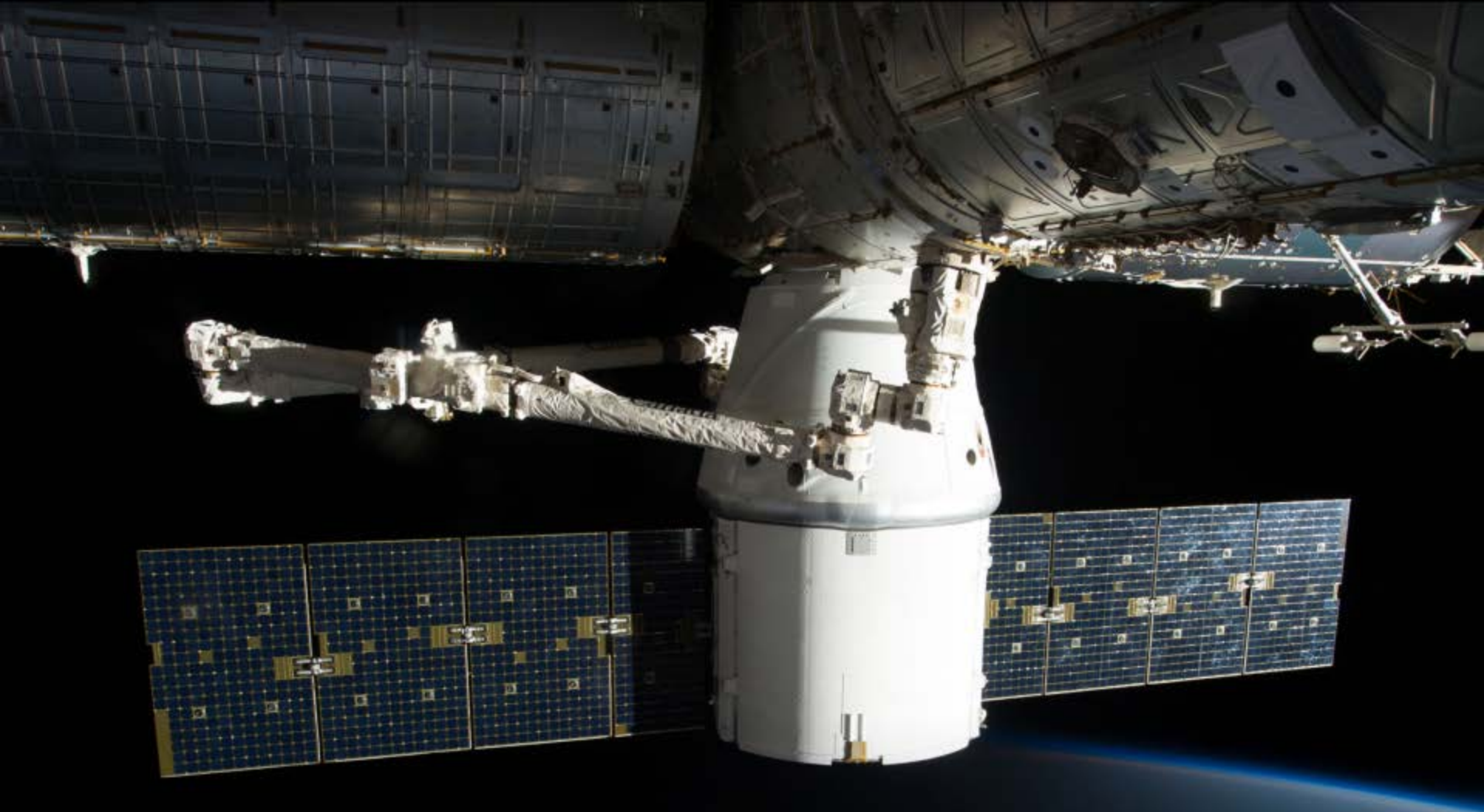


Upcoming

- Ongoing production toward Demo 1 & Demo 2
- ECLSS Integrated Testing
- Space Suit Qualification
- Propulsion System Testing
- Launch Site Readiness



Dragon Propulsive Hover Test Video



Thank You!