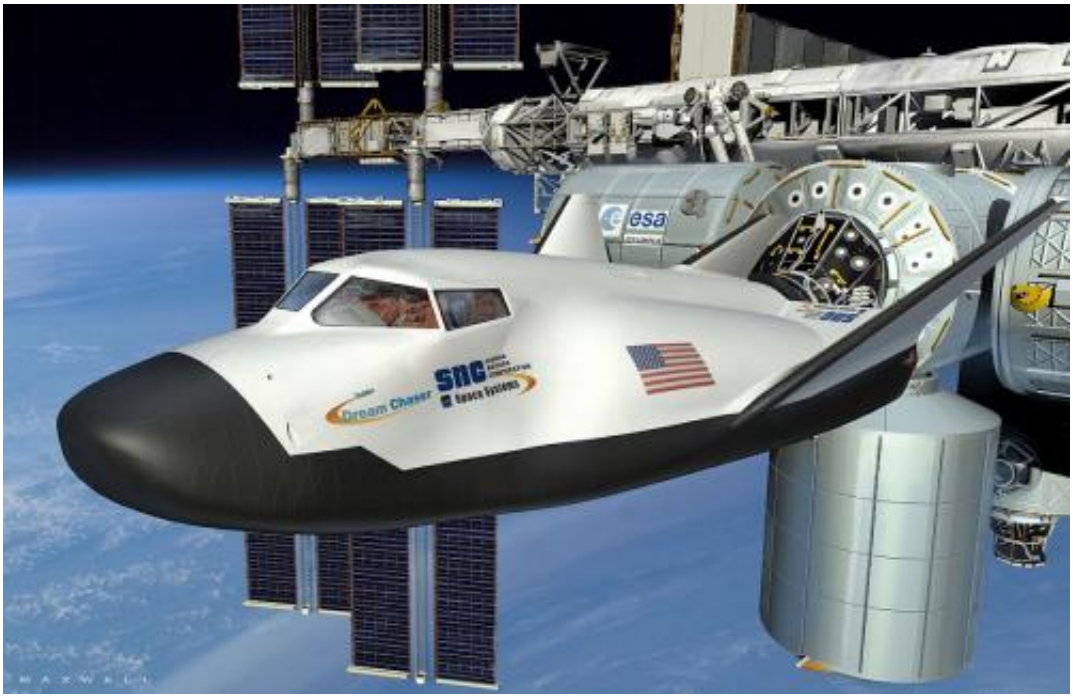
Commercial Dream Chaser closer to critical design review and first flight

July 24 2014, by Ken Kremer



Dream Chaser commercial crew vehicle built by Sierra Nevada Corp docks at ISS

The winged Dream Chaser mini-shuttle under development by Sierra Nevada Corp. (SNC) has successfully completed a series of risk reduction milestone tests on key flight hardware systems thereby moving the private reusable spacecraft closer to its critical design review (CDR) and first flight under NASA's Commercial Crew Program aimed at restoring America's indigenous human spaceflight access to low Earth

orbit and the space station.

SNC announced that it passed NASA's Milestones 9 and 9a involving numerous Risk Reduction and Technology Readiness Level (TRL) advancement tests of critical Dream Chaser® systems under its Commercial Crew Integrated Capability (CCiCap) agreement with the agency.

Seven specific hardware systems underwent extensive testing and passed a major comprehensive review with NASA including; the Main Propulsion System, Reaction Control System, Crew Systems, Environmental Control and Life Support Systems (ECLSS), Structures, Thermal Control (TCS) and Thermal Protection Systems (TPS).

The tests are among the milestones SNC must complete to receive continued funding from the Commercial Crew Integrated Capability initiative (CCiCAP) under the auspices of NASA's Commercial Crew Program.

Over 3,500 tests were involved in completing the Risk Reduction and TRL advancement tests on the seven hardware systems whose purpose is to significantly retire overall program risk enable a continued maturation of the Dream Chaser's design.

Dream Chaser is a reusable lifting-body design spaceship that will carry a mix of cargo and up to a seven crewmembers to the ISS. It will also be able to land on commercial runways anywhere in the world, according to SNC.

"By thoroughly assessing and mitigating each of the previously identified design risks, SNC is continuing to prove that Dream Chaser is a safe, robust, and reliable spacecraft," said Mark N. Sirangelo, corporate vice president of SNC's Space Systems, in a statement.

"These crucial validations are vital steps in our Critical Design Review and in showing that we have a very advanced and capable spacecraft. This will allow us to quickly and confidently move forward in restoring cutting-edge transportation to low-Earth orbit from the U.S."

SNC former astronaut Lee Archambault prepares for Dream Chaser® Crew Systems Test. Credit: SNC

The Dream Chaser is among a trio of US private sector manned spaceships being developed with seed money from NASA's Commercial Crew Program in a public/private partnership to develop a next-generation crew transportation vehicle to ferry astronauts to and from the International Space Station by 2017 – a capability totally lost

following the space shuttle's forced retirement in 2011.

The SpaceX Dragon and Boeing CST-100 'space taxis' are also vying for funding in the next round of contracts to be awarded by NASA around August/September 2014.

"Our partners are making great progress as they refine their systems for safe, reliable and cost-effective spaceflight," said Kathy Lueders, manager of NASA's Commercial Crew Program.

"It is extremely impressive to hear and see the interchange between the company and NASA engineering teams as they delve into the very details of the systems that help assure the safety of passengers."

After completing milestones 9 and 9a, SNC has now received 92% of its total CCiCAP Phase 1 NASA award of $227.5 million.

"We are on schedule to launch our first orbital flight in November of 2016, which will mark the beginning of the restoration of U.S. crew capability to low-Earth orbit," says Sirangelo.

Dream Chaser measures about 29 feet long with a 23 foot wide wing span and is about one third the size of NASA's space shuttle orbiters.

Following helicopter release the private Dream Chaser spaceplane starts glide to runway at Edwards Air Force Base, Ca. during first free flight landing test on Oct. 26, 2013 – in this screenshot. Credit: Sierra Nevada Corp.

It will launch atop a United Launch Alliance (ULA) Atlas V rocket from Cape Canaveral Launch Complex 41 in Florida.

Since the forced shutdown of NASA's Space Shuttle program following its final flight in 2011, US astronauts have been 100% dependent on the Russians and their cramped but effective Soyuz capsule for rides to the station and back – at a cost exceeding $70 million per seat.

The Dream Chaser design builds on the experience gained from NASA Langley's earlier exploratory engineering work with the HL-20 manned lifting-body vehicle.

Scale models of NASA's Commercial Crew program vehicles and launchers; Boeing CST-100, Sierra Nevada Dream Chaser, SpaceX Dragon. Credit: Ken Kremer/kenkremer.com

Read my prior story detailing the wind tunnel testing milestone – here.

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