

NASA's Return on Investment Report

Issue 1

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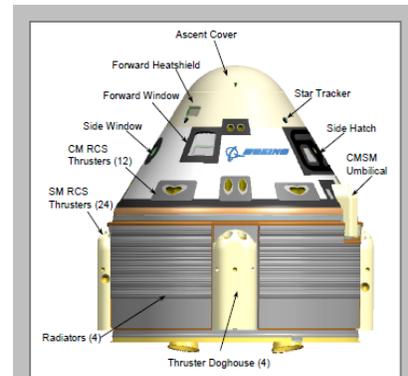
Welcome to the first edition of the Return on Investment Report. The Commercial Spaceflight Development Division at NASA Headquarters will distribute this bi-monthly newsletter of accomplishments, progress, and happenings in NASA's commercial spaceflight development programs. It will highlight the remarkable returns on the American taxpayers' investment from NASA's commercial spaceflight development endeavors being realized every day. This first edition focuses on the initial achievements of NASA's industry partners in the Commercial Crew Development Round 2 (CCDev 2) initiative.

Boeing Completes Delta Systems Definition Review

The Boeing Company achieved a major milestone on May 19 by completing their delta Systems Definition Review (SDR) barely a month after CCDev 2 Space Act Agreements were executed. Boeing engineers presented numerous updates and improvements to their CST-100 spacecraft design since the original SDR under CCDev 1 which occurred in October 2010. These updates included improved protection from orbital debris and changes to the crew module, which enables improved packaging and mounting of tanks and other equipment. Boeing also presented a comparison of their architecture with the latest drafts of NASA's requirements and standards for International Space Station (ISS) commercial crew transportation.

The review was preceded by several technical interchange meetings between Boeing engineers and NASA experts in key engineering and safety disciplines. "We brought in outside experts who reviewed the vehicle design from an overall integrated system perspective to ensure that we are designing and building a safe and affordable system," said Keith Reiley, Deputy Program Manager of Commercial Crew Programs for Boeing. Upcoming events for the Boeing CCDev 2 team are the Phase Zero Safety Review milestone in June, where Boeing will present a plan for indentifying and mitigating potential hazards to safe spaceflight for the CST-100 system. Boeing also plans to conduct a full-scale landing airbag drop demonstration later this summer.

For more information, contact Boeing's Edmund Memi at 281-226-4029.



*Computer-Generated Picture
of the Boeing CST-100
Commercial Crew Vehicle*

Space X Successfully Accomplishes First CCDev 2 Milestone

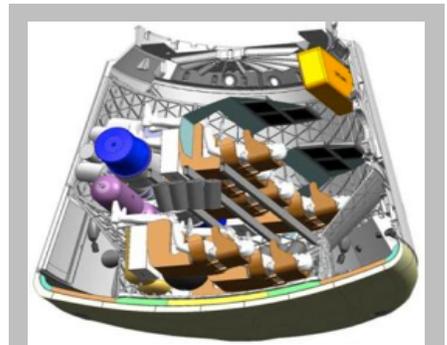
During CCDev 2, SpaceX plans to continue to mature their crew transportation system, with emphasis on Launch Abort System (LAS). SpaceX's crew transportation system features the existing and flight-proven Falcon 9 launch vehicle and Dragon spacecraft which have been designed since inception for crew carriage. Thus, the system on which SpaceX will focus during CCDev 2 is the safety-critical LAS. SpaceX also plans to mature their crew systems design and perform crew cabin trials during CCDev 2.

SpaceX successfully completed its initial milestone, a CCDev 2 Kickoff Meeting, in May. During the Kickoff Meeting, SpaceX reviewed NASA certification requirements, and the company presented to NASA officials the design status of all systems along with risks and potential mitigations. The next SpaceX milestone is the LAS Propulsion Conceptual Design Review, planned for July, where SpaceX will present design data, documentation, risk assessments, and schedule data along with analysis and verification plans to show that their concept is technically sound and accommodates human factors requirements.

For additional information, contact SpaceX's Garrett Reisman at 310-363-6400 x 21105.



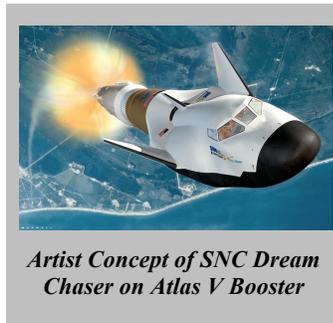
Artist's Depiction of SpaceX LAS Operation



Computer-Generated Picture of SpaceX Crew Capsule Layout

Sierra Nevada Corporation Completes Systems Requirements Review

NASA's investment in Sierra Nevada Corporation (SNC) during the CCDev 2 effort will help advance the company's commercial crew transportation system design through a Preliminary Design Review. The spacecraft, known as Dream Chaser, is a reusable, piloted lifting body derived from NASA's HL-20 and will be launched on an Atlas V launch vehicle.



Artist Concept of SNC Dream Chaser on Atlas V Booster



Artist Concept of SNC Dream Chaser Spacecraft on ISS

SNC successfully conducted a project kickoff meeting and System Requirements Review milestone on June 1. For the Systems Requirements Review, SNC provided ten documents to NASA and SNC's partner organizations for review and comment. The documents included the company's Human Rating Certification Plan, Risk Mitigation Plan, System Engineering Management Plan, and several others that established a preliminary system architecture for the Dream Chaser system. NASA and the SNC partner organizations provided comments and suggestions to these documents and SNC dispositioned all the comments and suggestions with acceptable closure plans. The next SNC CCDev 2 milestone, Tip Fin Airfoil Selection, will feature test results on candidate airfoils, and the best airfoil for aerodynamic and thermal performance will be selected for the Dream Chaser's tip fins.

For more information contact SNC's Cassie Kloberdanz at 720-407-3264.

Blue Origin Successfully Kicks Off CCDev 2 Effort

Blue Origin is developing vehicles and technologies to dramatically lower the cost and increase the reliability of human access to space. The NASA investment during the CCDev 2 effort will accelerate development of a crew transportation system capable of transporting crew and cargo safely and affordably to low Earth orbit. Their crew transportation system is comprised of a reusable biconic space vehicle launched first on an Atlas V launch vehicle and then on Blue Origin's own Reusable Booster System. The Reusable Booster System features a new, low cost liquid oxygen/liquid hydrogen engine that could potentially be suitable for a variety of other applications.



Computer-Generated Picture of the Blue Origin Space Vehicle

In May, Blue Origin successfully conducted project kickoff meetings for each of the three CCDev 2 efforts. The first effort focuses on maturing their overall space vehicle design. The second effort features ground and flight tests of their pusher escape system for astronauts. The pusher escape system is a key enabler of full-vehicle reusability, and it has the potential to significantly increase the safety of the system. The third effort revolves around accelerating the engine development for their Reusable Booster System. Blue Origin's next CCDev 2 milestones are scheduled for September. These milestones include a space vehicle Mission Concept Review and a review of Blue Origin's Reusable Booster System engine thrust chamber interface and test plan.

Stay tuned for future editions of the NASA's Return on Investment Report where NASA will describe to you the unique and innovative achievements of NASA's commercial spaceflight development efforts. In the meantime, feel free to review some of NASA's other commercial space accomplishments at: <http://www.nasa.gov/exploration/commercial/index.html>.