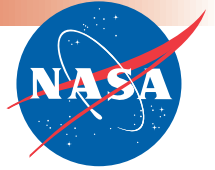


SPACE LAUNCH INITIATIVE

Technology Summary



NASA Unique Systems

As NASA plans future space exploration missions, its highest priority is the safety of crew members – a need “unique” to NASA, as commercial launch companies do not yet have missions involving humans in space.

NASA’s Space Launch Initiative focuses on increasing the safety of accessing space while reducing payload launch costs from today’s \$10,000 per pound to \$1,000 per pound. NASA’s goal for next generation reusable space vehicles is to decrease the probability of the loss of a crewmember to below one in ten thousand.

Crew safety includes successfully escaping a spacecraft in an emergency. Second generation reusable space vehicles will require on-ground, in-flight and on-orbit crew escape systems.

Astronauts on board the space shuttle can escape an emergency in two ways – when the Shuttle is on the ground and while in a controlled gliding flight – but not when the vehicle is in space. The Shuttle’s in-flight escape system, which also can be used for escape when the orbiter is on the ground, involves exiting from a side hatch opening in the middeck of the orbiter, sliding down a pole and parachuting to Earth. A secondary on-ground escape route is through the left-hand flight deck overhead window.

Other NASA unique needs to be considered for second generation reusable launch vehicles include environmental control systems, cockpit systems, mission planning, flight operations, crew return vehicles, crew transfer vehicles, and non-crew transfer vehicles.

Environmental controls include breathable air, drinkable water, temperature control, advanced space suits, and environmental monitoring systems.

Cockpit systems include the hardware and software used by the crew to interface with the vehicle’s avionics systems.

Mission planning and flight operations include the planning, designing and operating of human space missions as well as the training of astronauts and ground controllers.

Vehicles for consideration are those which could return a crew from the International Space Station to Earth, transfer a crew in space from one vehicle or Space Station to another, and transfer cargo in space from one vehicle or Space Station to another.

These NASA unique needs will be managed for Marshall by Johnson Space Center in Houston.

The Marshall Space Flight Center leads the Space Launch Initiative with support from Johnson Space Center; Ames Research Center in Moffett Field, Calif.; Stennis Space Center in Bay St. Louis, Miss.; Kennedy Space Center, Florida; Dryden Flight Research Center in Edwards, Calif.; Glenn Research Center in Cleveland; Langley Research Center in Hampton, Va.; the Jet Propulsion Laboratory in Pasadena, Calif.; and the Air Force Research Laboratory, which includes research and development facilities at nine United States Air Force bases nationwide.