



HUMAN HEALTH AND PERFORMANCE

Exploring Space | Enhancing Life

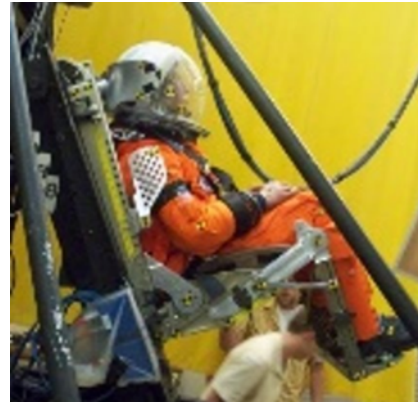
Occupant Protection Group

The Occupant Protection (OP) team at NASA is primarily focused on keeping astronauts safe during dynamic phases of spaceflight. These phases include launch, ascent, aborts, on orbit maneuvers, re-entry, descent and landing. Lunar and other planetary missions would also require that safety measures be taken during descending to and ascending from a Planetary surface. The OP team has helped develop standards for vehicle designers that limit the loads and accelerations that crewmembers can be exposed to throughout a mission. Since time in space causes changes to astronauts' bodies, the standards account for this by reducing exposure limits at the end of a mission.

The OP team is currently assisting the designers of the NASA Orion, Boeing Starliner, and SpaceX Dragon space vehicles to meet safety requirements to certify them



for flight. These designs are tested using Anthropomorphic Test Devices (ATD) also called crash test dummies, and computer



modeling. First, the designers identify the range of potential conditions that crewmembers would experience, typically worst at landing and during ascent aborts. Then, physical acceleration tests are performed in a laboratory with an ATD in the same conditions the crewmembers could experience. Using these tools, the vehicle designs can show NASA that the design is safe for crew.

For the next generation of spacecraft, the OP team conducts research to improve the safety of spaceflight, as well as improve safety for occupants in automobiles and airliners. The OP team works in collaboration with experts and scientists from the Air Force, Army, Federal Aviation Administration, National Highway Traffic Safety Administration, NASCAR, and multiple Universities and Institutions. Research is focused on factors unique to spaceflight such as the effects of spaceflight on astronaut bodies, unique acceleration environments expected in spaceflight, and the effects of the spacesuit and helmet on injury risk. Research is also focused on factors that address conditions that are common to automotive and aviation environments, such as differences between men and women.

For more information:
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