

## The Augustine Committee Report - Review of U.S. Human Space Flight Plans

In May 2009, President Obama [directed](#) NASA to establish a committee to assess the condition of the current U.S. human space flight program and provide potential options for the new Administration that ensure its future sustainability. NASA's currently funded human space flight program calls for the space shuttle program to be terminated in FY2010, U.S. participation in the International Space Station (ISS) to end in 2015, and NASA's resources to focus instead on the Constellation Program to develop new rockets (Ares 1 and Ares V) and spacecraft (Orion and Altair) to return astronauts to the Moon by 2020 and someday send them to Mars, although dramatic changes have been [proposed](#) by President Obama in the FY2011 budget request.

The committee was chaired by Norman Augustine, former CEO of Lockheed Martin and a well respected chair of previous science and engineering advisory committees. Following are the committee's key findings from its [Summary Report](#) issued on September 8, 2009. The final report, [Seeking a Human Spaceflight Program Worthy of a Great Nation](#), was issued on October 22, 2009.

The committee concluded that the current program is crippled by inadequate resources and support. While there is consensus that the next step for human space flight exploration is beyond low Earth orbit (LEO), where human space flight activities have been concentrated since the 1970s, there is ongoing debate as to what should be the next destination. The Augustine committee identified the choices as: returning to the Moon as a steppingstone to Mars ("Moon First"), sending humans to Mars without extensive work on the Moon ("Mars First"), or opting for "free space" destinations such as asteroids or [Lagrange points](#), but not initially landing on the Moon or Mars ("Flexible Path").

In discussing potential strategies, the committee found that human exploration beyond LEO "is not viable under the FY2010 budget guideline." In fact, additional funding is required to complete the remaining six shuttle missions, which the committee believes will carry over to FY2011. The committee found that "meaningful human exploration is possible under a less constrained budget, ramping to approximately \$3 billion per year above the FY 2010 guidance in total resources" until FY2014, followed by a 2.4% increase thereafter. The committee stressed that two ways to find additional resources would be engaging international partners, and relying on the commercial space industry to develop and operate less costly vehicles.

Additional key findings identified by the committee:

- Continued cost and schedule overruns will retard availability of Constellation Program capabilities to at least 2017, creating a 7-year "gap" between the termination of the space shuttle and the availability of a new system, during which time the United States will not be able to launch astronauts into space, 2 years longer than expected.
- Success of the ISS program depends on its utilization until 2020.
- Mars is the ultimate, but not the best first destination for human exploration. "Moon First" or "Flexible Path" are both more viable options.
- Although subject to a certain amount of risk, consideration should be given to turning transport and cargo service to LEO over to the commercial sector.
- Additional investments by NASA in developing space technology would contribute substantially to exploration goals.