

EIGHT YEARS AFTER COLUMBIA, NATION STILL LACKS CONSENSUS ON VISION FOR HUMAN SPACEFLIGHT

COMMENTARY
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Today is the eighth anniversary of the loss of the space shuttle Columbia in the skies over Texas.

Columbia disintegrated during reentry because of a hole in its wing that allowed superheated gases to enter and deform it. The resulting aerodynamic forces caused the orbiter to break apart, killing its seven crew members: Rick Husband (NASA), William McCool (NASA), Michael Anderson (NASA), David Brown (NASA), Kalpana Chawla (NASA), Laurel Clark (NASA), and Ilan Ramon (Israeli Air Force). The hole was formed by a piece of foam that came off the External Tank during launch and hit the leading edge of the wing.

Almost overshadowed by the commemoration of the 25th anniversary of the Challenger accident last Friday, this tragedy imparted just as much heartache and had an even more profound impact on the U.S. human spaceflight program.

The accident [investigation](#) exposed the particular risks associated with a side-mounted system, which makes the orbiter vulnerable to chunks of foam liberated from the External Tank during launch. It also revealed NASA's incomplete understanding of that foam and why it comes off, and its failure to adequately study the phenomenon despite years of knowledge of foam-shedding. Technical, organizational and cultural failures were all cited by the Columbia Accident Investigation Board (CAIB), as they were in the investigations of the two preceding U.S. human spaceflight tragedies that were commemorated last week: Apollo 204 (January 27) and Challenger (January 28).

The Columbia accident hastened the end of the space shuttle program; the goal became to use the shuttle only to the extent necessary to complete construction of the International Space Station (ISS). The implications of that decision for operation of the ISS -- which was designed to rely on the significant cargo carrying capability of the shuttle for logistics throughout its lifetime, never mind crew rotation -- were secondary to the desire to terminate the program. For some it was because of the belief that the system's design is inherently too risky, while others long considered the shuttle a disappointment that never achieved its promise of low-cost access to space and a drain on NASA's budget.

Despite the human tragedy and the technical and organizational weaknesses it exposed at NASA, the Columbia tragedy actually spurred the nation toward even loftier human spaceflight goals. Eleven and a half months later, on January 14, 2004, President George W. Bush directed

NASA to return humans to the Moon by 2020 and then go on to Mars in his Vision for Space Exploration speech.

Today, the program spawned by that speech, Constellation, is on its way to being terminated and the future of the U.S. human spaceflight program is considerably in doubt. Government efforts to build a successor to the shuttle over the past three decades -- the National Aerospace Plane, X-33/Venturestar, the Space Launch Initiative, the Orbital Space Plane -- all failed. The 2010 NASA authorization act directs NASA to try again. The agency is to build a new space transportation system and crew vehicle while at the same time funding the commercial sector to do the same thing. The policy is in place, but the funding is not and with the country's economic situation in turmoil, human spaceflight advocates worry that NASA will continue to be expected to do too much with too little and fail to reach the goal line yet again.

In testimony to Congress in 2003, CAIB chairman [Adm. Harold Gehman \(Ret.\)](#) called on the country to "establish the Nation's vision for human space flight and determine how willing we are to resource that vision." Eight years later, little progress has been made on that score.

The Bush Vision is history. Instead, President Obama wanted to do one thing, but Congress wanted to do another, so they split the difference and told NASA to do both, but with no additional funds. Agreement could not be reached on the next destination for human spaceflight so they passed the buck to the National Research Council to do a study about it. NASA is directed to contract for the study in FY2012, not now, and since a typical NRC study takes 18 months, under the best of circumstances it would come out in calendar year 2014, halfway through the next presidential term.

Meanwhile, NASA is directed to immediately begin the development of a heavy lift launch vehicle and multipurpose crew capsule even though the destination for that system will not be decided until at least 2014. Yes, it will be a "backup" for commercial crew efforts to build a system for low Earth orbit, but its ultimate requirements are TBD.

The loss of the Columbia crew led to an earlier-than-planned exit for the space shuttle, but the vision that CAIB identified as a necessary replacement faded. The future is as uncertain now as it was eight years ago today, hardly a fitting tribute to those seven brave souls.