



Chapter V

The Columbia Disaster: Culture, Communication & Change

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EXECUTIVE SUMMARY

The National Aeronautics and Space Administration (NASA) is a government organization, founded to explore space to better understand our own planet and the universe around us. Over NASA's history, there have been unprecedented successes: Apollo missions that put people into space and walking on the moon, the remarkable findings of the Hubble space telescope and the Space Shuttle Program, allowing astronauts to perform scientific experiments in orbit from a reusable space vehicle. NASA continues to be a source of national wonder and pride for the United States and the world. However, NASA has failures too. In February of 2002, the Space Shuttle Columbia disintegrated as it returned to earth. This event occurred 16 years after the Space Shuttle Challenger exploded during take-off. As information was collected, investigators found that many of the problems uncovered during the Challenger investigation were also factors for Columbia. Underlying both disasters was the problem of relaying complex engineering information to management, in an environment driven by schedule and budget pressure. Once again, NASA is looking at ways to better manage space programs in an environment of limited resources.

ORGANIZATIONAL BACKGROUND

NASA was founded in 1958 to explore space. A year earlier, the Soviet Union beat the United States into space by launching Sputnik, the first satellite. In the United States,

this was seen as an embarrassment, and the need for a space program was pressing. Only a few short months after the formation of NASA, the first American space missions were launched. In 1969, NASA's Apollo 11 mission put the first humans on the moon surface. NASA's space program has changed the way mankind views the earth and helped bring about many important scientific findings that have resulted in numerous "spin-offs" in science, technology and commerce. After many other successful manned space flights, the Space Shuttle Program was initiated. The goal was to develop a reusable vehicle for frequent access to and from space. After nine years, the first shuttle, Columbia, was launched from Kennedy Space Center in 1981. Columbia was a remarkable success, though the promise of frequent access to space has never been realized. (Columbia flew 24 missions, the most of any shuttle in the fleet.) Today, NASA is renown for its discoveries and explorations in space — both manned and unmanned. NASA is truly a unique governmental agency with the lofty mission shown in Figure 1.

In 1986, the world was shocked and saddened as the Challenger exploded during takeoff. Seven astronauts were dead along with the first civilian to ride the shuttle, Christy McAuliffe, an elementary school teacher. The Rogers Commission, formed by an executive order from President Reagan, found that design flaws contributed to the Challenger's explosion. During the investigation, it was revealed that NASA engineers and management knew about the problems with the O-rings and failed to act on the information that was available. The report was also critical of safety procedures and Space Shuttle Program management.

Sixteen years later, on February 1, 2003, the space shuttle Columbia disappeared. In the control room, contact was lost with the Columbia at 9:00 a.m. Minutes later, the Houston mission control room was locked down, as the team of ground support realized a disaster was occurring. By 2:05, President Bush addressed the public, "Columbia's lost; there are no survivors".

The Columbia had disintegrated when it reentered the earth's atmosphere. Seven astronauts were dead, including the first Israeli astronaut and an Indian astronaut, who immigrated to the United States. The sadness of the national disaster deepened as pieces of the Columbia shuttle began to turn up in Texas and Louisiana.

A NASA internal investigation was conducted. In the wake of 9/11, theories of a terrorist attack surfaced and were quickly dispelled. The theory that a piece of foam may have damaged the wing was proposed. It was quickly dismissed too, as not being possible for the foam to cause such a catastrophic failure. As the pieces of Columbia were collected and the shuttle was reassembled, it was determined that a large piece of insulation foam broke off during launch, and hit Columbia's left wing at a velocity of 500 mph. On reentry, the heat was too great for the damaged shuttle, causing it to disintegrate.

Figure 1. NASA's vision and mission

NASA Vision	NASA Mission
To improve life here, To extend life to there, To find life beyond.	"To understand and protect our home planet, To explore the universe and search for life, To inspire the next generation of explorers ...as only NASA can."

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