

# Challenger Disaster Muddles NASA's Future

Far from settling down to a technical investigation like those that have often followed even the most tragic airline accidents, the turmoil surrounding NASA ever since the Jan. 28 explosion of the space shuttle Challenger has continued to grow. Ranging from a scathing indictment of the agency's safety policies by its chief astronaut to the climactic beginnings of recovery of the remains of Challenger's crew, the affair has rapidly grown to affect NASA from the topmost heights of its administration to the width of its operations to the shape of its future.

As both a presidential commission and a team of investigators set up by NASA itself continued to probe the actual cause of the mishap, attention remained focused on the likelihood of leaking seals between segments of one of the shuttlecraft's two solid-propellant booster rockets. In a reconstruction of the accident's possible events, Deputy Shuttle Chief Thomas L. Moser of NASA's Johnson Space Center in Houston described to the commission a scenario that began with a puff of smoke, observed coming from the right-hand booster about half a second into the flight. A plume of flame was observed from the same area at about 58 seconds; and at 64 seconds, he said, there was a possible leak of liquid hydrogen propellant from the shuttle's huge external fuel tank. At 72 seconds, the engineer/analysts believe, the lower of two metal braces connecting the booster to the external tank broke, allowing the still-firing booster to pivot into the tank with its explosive contents. Though the booster itself had still not been recovered when this scenario was constructed, Moser said "there are places on [recovered pieces of] the external tank where we can detect impact from the right."

But even apart from the technical analysis itself, another focus of the shuttle investigators has been the question of why Challenger was allowed to take off at all. Engineers from the rocket-booster manufacturer, for example, had already told the commission members of prelaunch concerns that the cold weather at Cape Canaveral might render the seals unsafe. And on March 4, veteran astronaut John Young, head of the NASA astronaut office, sent a strong memorandum to several NASA officials, including all the astronauts, questioning the agency's way of dealing with safety issues in the shuttle program.

Noting the status of the booster-rocket seals as a "priority 1" item — in which the shuttle and the lives of its crew would be at stake if something went wrong — he wrote, "There is only one driving reason

that such a potentially dangerous system would ever be allowed to fly — launch schedule pressure."

"People being responsible for making Flight Safety First when the launch schedule is First cannot possibly make Flight Safety First no matter what they say," he added in the memo, which was publicly released four days later by NASA. "If the management system is not big enough to STOP the Space Shuttle Program *whenever* necessary to make Flight Safety corrections, it will NOT survive and neither will our three Space Shuttles or their flightcrews."

Besides his comments, Young included a list of six "examples of uncertain operational and engineering conditions or events which we 'routinely' accept now in the Space Shuttle program." Ranging from quick-disconnect valves that might close unexpectedly to an incorrectly locked-up valve in the shuttle's reaction-control system, four of the cited cases, he said, could have resulted in the loss of vehicle and crew. In addition, he enclosed a list of nearly three dozen other "safety-related items" that had been prepared on the day of the accident by the shuttle Systems Division. "On an individual basis," wrote Young, "they were not big enough to slow or stop the launch rates. But totally, this list is awesome. The list proves to me that there are some very lucky people around here."

Several NASA officials were quoted in the press as saying that some of the cited items had already been dealt with, noting that safety has always been the agency's primary concern. When Young's memo was released by NASA, in fact, it bore a cover letter by recently appointed "shuttle chief" Richard H. Truly, in which Truly wrote that "I certainly concur with John's thrust — that flight safety must be NASA's first consideration. . . . We will not launch again until safety related issues have been properly addressed throughout the total NASA system."

The presence of Truly in the shuttle program at all, in fact, was another result of the Challenger incident. The former astronaut had twice flown the shuttle in space (as well as during its earlier air-drop tests from the back of a 747 jet), most recently on a mission aboard Challenger that landed Sept. 5, 1983. Less than a month later, Truly left NASA to head the U.S. Naval Space Command. But less than a month after Challenger's accident, Rear Admiral Truly was back at his old agency as NASA associate administrator for space flight, or shuttle chief. The change also hastened the transfer of the job's former occupant, Jesse W. Moore, to his already announced new position as head

of Johnson Space Center.

As for when the shuttle will fly again, a NASA "Replanning Task Force" is evaluating candidate schedules that would begin in 12 to 18 months, though an actual go-ahead still depends on the accident investigation and other analyses.

But NASA's changes are extending all the way to the top. For months, the agency has been operating under Acting Administrator William R. Graham, named to the temporary post while then-administrator James Beggs went on leave because of charges stemming from a criminal indictment. On Feb. 25, however, Beggs resigned from the job. President Reagan's new choice as space agency head is James C. Fletcher, who, if confirmed by the Senate, will be taking on the post for the second time. He originally became NASA administrator in 1971 — the year before the space shuttle program was announced — and stayed until 1977. Now a board member of five corporations, he also chairs the Three Mile Island #2 Safety Advisory Board and is a consultant to (and former director of) the President's Defensive Technologies Study Team, which formulated the program for the Strategic Defense Initiative.

Does Fletcher see any parallels between his first tenure at NASA and his possible second, such as the possibility of being there when the shuttle rises, phoenix-like, from its own ashes? "It's very different," he told SCIENCE NEWS, commenting that he is reluctantly accepting only because the President asked him. The first time around, he says, "I wanted the job." — J. Eberhart

## Female-to-male AIDS link found

Scientists tracking AIDS have identified the suspect virus in vaginal and cervical secretions of some antibody-positive women and have found possible signs of it in red blood cells.

Though the discovery of the virus in genital secretions does not prove that women can infect men through heterosexual contact, the virus's presence does provide a possible route for transmission, according to members of two research groups that made the findings independently of one another. Suspected female-to-male transmission is a rare occurrence in the United States — as of March 10, only 41 of 18,070 reported U.S. AIDS cases were in men with heterosexual activity as the only possible exposure, according to the Centers for Dis-