

Shuttle loss sets back space program

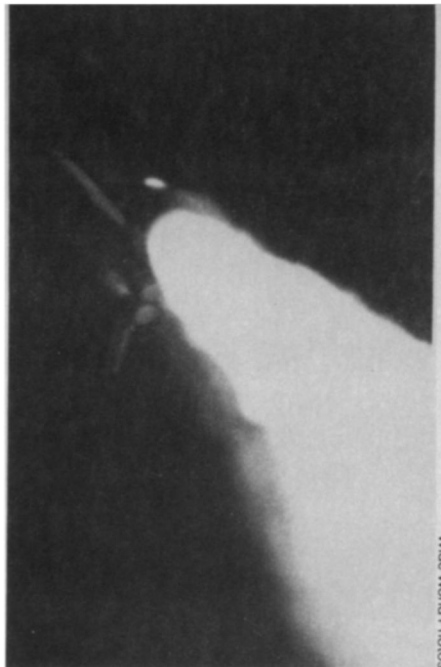
The explosion that destroyed the space shuttle Challenger lasted just a fraction of a second (SN: 2/1/86, p. 68). Its impact on future space flights may stretch over a far greater time period. Although no firm decisions have yet been made, several programs, such as the Galileo mission to Jupiter and the placing of the Hubble space telescope into orbit, are likely to be delayed or canceled.

Also lost in last week's accident was the second Tracking and Data Relay Satellite (TDRS-B), which was to be launched from Challenger. The first satellite was put into orbit during Challenger's maiden flight in April 1983 (SN: 4/16/83, p. 244). These communications satellites were designed to fill gaps in the ground-station network used to monitor data from spacecraft. A third TDRS, originally meant to be an orbiting spare, will probably take the place of TDRS-B, if and when it can be launched. Without two satellites in operation, the space telescope, for instance, could not function.

What happens to the NASA launch schedule (SN: 1/4/86, p. 6) depends a great deal on the outcome of an investigation into the disaster's cause. This week, President Reagan appointed an independent commission, headed by William P. Rogers, former secretary of state, and Neil A. Armstrong, former astronaut, to take charge of the investigation. NASA's interim investigative team, selected immediately after the disaster, will now funnel its information to the commission, which is to report and make recommendations within 120 days. The launching of shuttle missions will be suspended at least until the commission completes its investigation.

After a week of collecting debris scattered over thousands of square miles of the Atlantic Ocean and sifting through photographs and telemetry data, NASA investigators are beginning to focus on one of the shuttle's two solid-fuel rocket boosters. Dramatic photographs, released earlier this week, show a blowtorch-like flame appearing on the side of the right booster about 15 seconds before the explosion. This "unusual plume," as NASA described it, may have ignited the liquid hydrogen fuel in the adjacent external fuel tank. However, NASA officials were not yet ready to postulate a connection between the mysterious flame and the explosion.

The rocket boosters were considered to be among the more reliable components of the space shuttle system. They are the largest solid-fuel rockets ever flown and the first designed to be reusable. Nevertheless, NASA reports released this week indicate that accidents and personnel problems have plagued



Flame spurts from right booster.

the servicing and maintenance of the shuttle's boosters.

These rockets are assembled from four separate sections. A poor connection at the seam between two such sections may have allowed the fuel to burn through the rocket's steel casing. The flames from the burning of this fuel, consisting of ammonium perchlorate, powdered aluminum and iron oxide held together by a plastic binder, can reach a temperature of 5,600°F, which is high enough to penetrate the external fuel tank's insulation and melt its aluminum shell.

Some NASA officials say that if the problem turns out to involve just the boosters and can easily be rectified, then shuttle flights could resume later this year. "This is fundamentally a sound system," says William R. Graham, NASA's acting administrator. "It's gone through 24 successful flights. . . . We believe it won't take a very long time to get this problem corrected."

One missing piece in the puzzle is what happened to the Challenger's boosters. About 30 seconds after the explosion, range safety officers used remote control to detonate explosive charges that burst the boosters to prevent them from veering off toward land and hitting a populated area. However, because the explosives were not supposed to demolish the rockets completely, large pieces may still be found resting on the ocean floor. One booster nose cone has reportedly been recovered.

Investigators are also taking a close look at the data transmitted from the Challenger before the explosion to see if any sensors detected the effects of the anomalous flare. One published report suggests that the right booster actually did lose about 5 percent of its power at approximately the time at which the flare appears on photographs. — I. Peterson

NIH limits animal studies at Columbia

The National Institutes of Health (NIH) last week suspended a portion of its funding for animal research at Columbia University in New York City after an unannounced site inspection by the agency turned up serious animal-care deficiencies. This is the first such suspension ordered since the agency's new animal-welfare accreditation rules went into effect Dec. 31 (SN: 11/2/85, p. 281).

The suspension involves only research conducted at the university's health sciences division — which includes the medical school — and is limited to studies using vertebrates, including dogs and sheep, above the level of rodents. Columbia hopes that its immediate steps to overcome the stated deficiencies will permit reinstatement of curtailed research funds within six weeks, according to university spokesperson Mae Rudolph. Though the university did not disclose how many research studies are affected, it said that at least 75 percent of the animals used in health sciences research are rodents.

A preliminary, unpublished report by NIH's surprise-inspection team challenged the adequacy of the division's veterinary care program, the sterility maintained during major surgery, the housing for dogs under quarantine and the techniques used to minimize health risks to laboratory personnel.

These deficiencies, cited as reasons for the suspension in a Jan. 27 letter to Columbia by NIH Director James B. Wyngaarden, were no surprise to university officials. "Last year, recognizing that there were deficiencies, the health sciences division began a major, long-range program of improvements," the university noted in a statement issued earlier this week. Moreover, Columbia requested and got an audience with NIH animal-care officials last December to discuss these deficiencies and the university's attempts to rectify them, according to William Dommel, assistant director of NIH's Office of Protection from Research Risks, in Bethesda, Md., which oversees animal-welfare rules.

The unannounced site visit, Dommel says, was triggered by two things: letters to NIH officials, including its director, complaining about the care and abuse of laboratory animals; and the university's own report on its animal-care program — a report required (under the new NIH animal-welfare rules) of all research institutions receiving funds from the Public Health Service, NIH's parent agency.

Dommel's office is in the preliminary phase of reviewing more than 600 other animal-welfare assurance reports submitted under those new rules. — J. Raloff