APOLLO

Tragedy Breeds Change

The changes have begun. Space activity on the ground, in orbit and perhaps all the way to the moon has been altered, postponed or both following the deaths of three astronauts and two airmen in hot oxygen fires only five days apart.

• The National Aeronautics and Space Administration, whose Apollo program has been shaken to the core, has indicated that from now on, every time men are testing an Apollo capsule on the ground or even within the atmosphere, the cabin will be filled with a less hazardous mixture of nitrogen and oxygen.

• The U.S. Air Force went a step further into space, and declared last week that its Manned Orbiting Laboratory, still almost two years away, would provide a helium-oxygen mixture for its two-man crew.

But NASA has still bigger problems. Something had to give in the tight schedule of development flights for Apollo and its Saturn V booster, and the space agency did its best to keep the show on the road as planned. Suspending the manned shots until the fire problem is resolved, NASA decided to keep the unmanned booster test calendar intact.

Three such missions are set for 1967. The first, to take place in the second quarter of the year, will be the maiden flight of the lunar module, aboard an uprated Saturn I. In the same quarter will be the first launch of the 7.5 million pound thrust Saturn V, carrying an unmanned command and service module. The command module was the scene of the Jan. 27 fire at Cape Kennedy. A second Saturn V flight is scheduled for the latter half of this year.

Despite these changes and the possibility of more to come, NASA witnesses before the Senate space committee investigating the tragedy, testified last week that modifications in the program might prove to be "procedural" rather than structural, and that it would be possible to "catch up" with the original schedule. As far as solving the mystery of the Cape tragedy, however, committee chairman Senator Clinton P. Anderson (D-N. Mex.) says that the NASA inquiry is "not even close."

The space agency, which has been doing most of its investigating by picking away at bits and pieces of the burned wreckage in the spacecraft interior, on Feb. 5 began removing equipment from the cabin for study. The board of inquiry was expected to order the entire spacecraft removed from its booster and taken to the Merritt Island, Fla., moonport for step-by-step disassembly.

The spacecraft in which the fire occurred differs in two particularly important respects from the one originally proposed to NASA by North American Aviation, which is now the prime Apollo contractor.

The original design had a quick-release emergency hatch, compared to the actual hatch which has three layers, 28 latches, and must be opened with a special torque wrench. Last week, only 10 days after the fire, NASA Assistant Administrator Robert C. Seamans Jr. admitted that the agency's board of inquiry into the accident is studying the possibility of a "change in access" to the cabin.

The other difference is in the environmental control system, for which North American had proposed a 7-psi., mixed-gas system. In April of 1962, a NASA Apollo official confirmed that "the ECS is . . . being designed to stabilize a two-gas atmosphere." The idea was later rejected in favor of pure oxygen because of the added complexity and weight of the required mixture control system. The additional valves, tanks, tubing and instruments needed to mix and monitor a two-gas system would probably burden Apollo with as much extra weight as three more astronauts. The proposed system, which was similar to the one now being studied for the Apollo Applications Program, included a sensor to equalize the gas mixture in response to the uneven leakage rate of oxygen and either nitrogen or helium, both of which are molecularly lighter.

When something, such as wiring insulation burns in an oxygen atmosphere, the oxygen molecules collide with those of the combustible material. If the pressure is increased, there are then more oxygen molecules available and thus more collisions and oxidation. In a two-gas atmosphere, however, the molecules of the second gas (helium or nitrogen) cut down the fire hazard by simply getting in the way and blocking many of the collisions.

Helium is a better choice than nitrogen from a purely fire-avoidance standpoint, since it conducts heat away from a heat source more quickly, thus requiring more energy to start a fire. In other words, things will ignite at lower temperatures in a nitrogen-oxygen atmosphere than in a helium-oxygen atmosphere.

PUBLIC POLICY

Medicine Under Fire

Public alarm over the quality of medical laboratory tests was predicted by Senator Philip A. Hart after his subcommittee heard testimony that fully one-quarter of lab tests done each year in the United States are erroneous.

The Michigan Democrat hopes the alarm will be pervasive enough to insure the passage of a bill to regulate medical laboratories, "the only aspect of medicine that is unlicensed."

In a week of hearings by the Senate Subcommittee on Antitrust and Monoply Legislation most witnesses addressed themselves to Senator Hart's proposal to stop doctors from profiting on drug and eyeglass prescriptions they write. The medical laboratories will fall under separate legislation.

The strongest attack on the laboratories came from Dr. David J. Sencer, director of the National Communicable Disease Center of the Public Health Service in Atlanta. He gave a figure of 125 million mistaken tests each year —a fourth of the tests done.

Serious and sometimes fatal reactions occur, perhaps 250,000 a year, from blood mismatching alone, Dr. Sencer says. In a study in California of 328 deaths of newborn babies, "avoidable laboratory factors" were implicated in 34.5 percent. These factors included unavailable or untrained personnel, inadequate facilities, faulty methods and deficient reporting of test results.

Dr. Morris Schaeffer, director of the New York City Health Department's Bureau of Laboratories, pointed out that in most states there is no licensing of clinical laboratories, and no restrictions against cut-rate mail-order labs, which are doing a thriving business.

"In some cases," he testified, "they are doing a so-called sink test, which means they pour the patient's sample down the sink and turn in a negative report." He was careful not to indict all mail-order laboratories of this practice.

On another issue under review, The North Carolina Eye, Ear, Nose and Throat Society warned that diseases will go undetected and the cost of glasses will rise if Congress forbids eye doctors from selling glasses.

Dr. Edward K. Isbey Jr., from Asheville, N.C., says a proposed bill would encourage patients to use optometrists instead of doctors, and "eye diseases will therefore in many cases go undetected."