

Leaving the shuttle can be a hard trip

It was not a whole rocket that failed on Aug. 25, just five days before the successful test of the space shuttle's redesigned booster (SN: 9/5/87, p. 151). It was merely a test example of a single, much smaller rocket motor, nine of which will be fastened around the first stage of the improved version of the tried-and-true Delta booster. NASA officials are optimistic that the failure will not delay the motor's coming into service, but the stakes are high — not just for this particular bit of technology, but for the restoration of the agency's reputation for being able to get things into space. The reason is that NASA's first intended use of the new motors is to help with its first launching of one of its own payloads that has been deliberately reassigned from the shuttle to one of the conventional, unmanned rockets now called expendable launch vehicles, or ELVs.

The satellite is the Cosmic Background Explorer (COBE), designed to detect electromagnetic emissions produced during the earliest history of the universe, in hopes of being able to locate the site of the "Big Bang" that started it all. The idea for COBE has been around for well over a decade, and when NASA planners in the late 1970s began scheduling everything possible to ride on the shuttle, COBE was on the list. However, it needs to be placed in an orbit tilted almost 90° to the equator, and ascending to such an orbit from the United States without passing over populated areas requires taking off from the West Coast — where there is so far no shuttle launchpad.

The U.S. Air Force had been planning such a facility for Vandenberg Air Force Base in California, and construction was even under way. Late last year, however, technical problems resulted in the indefinite delay of the site ("mothballed" was one official description). Last November, the planned liftoff of COBE was switched from the shuttle to an ELV.

COBE's liftoff is at present planned for February 1989, though the new rockets will have to be ready well before that. The rockets' first use is now scheduled for October 1988, carrying one of the Air Force's Global Positioning System satellites, designed to provide fast and accurate navigational "fixes" for aircraft and ships. For that mission, the Air Force will be introducing its new Medium Launch Vehicle, a version of the booster called a Delta 2. There, the main stage's liquid-propellant center section, to which the new solid-propellant rockets will be mounted, will be both longer and stronger than in past versions. For COBE, NASA will be using an "unstretched" center section, though with the same improved "strap-on" solid rockets.

The Delta, considered a venerable workhorse among launch vehicles, is made by McDonnell Douglas Corp. The strap-on rockets, called Castor 4A's, are produced by Morton Thiokol, the same company that makes the shuttle's big solid boosters. However, the malfunction that destroyed the shuttlecraft Challenger and cost the lives of its crew is thought to be unrelated to the Castor 4A failure, according to John Beckham, deputy Delta project manager at NASA's Goddard Space Flight Center in Greenbelt, Md. The shuttle disaster is believed to have been caused by exhaust gases leaking between the sections of the solid-propellant rocket casing, while the Castor 4A casing, says Beckham, is a single piece with no such seams. A team of engineers from Thiokol, NASA and the Air Force is still investigating the 4A failure; one possibility, Beckham says, is that exhaust gases from the rocket may have found their way through a sheet of insulation and started burning the solid-propellant "grain" from its forward end, causing it to burn out through the rocket's domed top from within. Pictures of the test, he says, show bright spots suggesting at least three places on the dome where such burn-through was apparently taking place.

— J. Eberhart

Cholesterol drug approved

The first of a new class of cholesterol-lowering drugs has been approved for use in patients, the U.S. Food and Drug Administration (FDA) announced last week. Called lovastatin, the drug acts by inhibiting the enzyme that controls the body's production of cholesterol in the liver. This indigenous cholesterol, along with that from certain foods, contributes to a person's blood cholesterol level. Excessive cholesterol levels, along with cigarette smoking and high blood pressure, have been implicated as contributors to heart disease. Cholesterol build-up narrows the arteries.

Manufactured by Merck Sharp & Dohme of West Point, Pa., lovastatin joins other cholesterol-lowering drugs like nicotinic acid and colestipol (SN: 6/27/87, p.407). In making the announcement, federal officials said clinical studies completed prior to FDA approval showed that lovastatin can reduce total cholesterol levels by 18 to 24 percent. As with the previously approved drugs, those announcing the approval recommended that lovastatin be used only in high-risk groups and in conjunction with diet and exercise therapy. □

Health hazard from copier exhaust

Copying machines are an indispensable part of office life, but the wet-process kind may also be making you and your co-workers ill. Canadian researchers recently studied 20 library, school, hospital and business buildings suspected of harboring agents that give their occupants headaches, irritated eyes and other maladies. Thirteen were found to contain air tainted with a group of paraffinic hydrocarbons emitted by wet-process copiers.

According to study leader Yoshio Tsuchiya of the National Research Council of Canada (NRCC) in Ottawa, these paraffinic hydrocarbons are members of a larger class of compounds called volatile organic compounds (VOCs), which are among the major components of indoor air pollution and are believed to contribute to "sick building syndrome." Tsuchiya presented his findings last week at the American Chemical Society's 194th national meeting in New Orleans.

Tsuchiya was led to the copier machines as a source of VOCs in 13 office buildings because they all showed a distinct "fingerprint" or mixture of specific VOCs. In several of the buildings copier exhaust accounted for more than 90 percent of total VOC content. He also detected the copier fingerprint in an apartment containing piles of photocopied paper. "We suspect, but can't

confirm [that the copied paper was the source of the VOCs]," he says.

What he has concluded, however, is that wet-process copy machines themselves may cause health problems. "Our suggestion," he says, "is to connect the copy machine exhaust to the outside."

In addition to office building occupants, more than 60 people asked NRCC to examine the air quality of their homes. Tsuchiya found that in most homes concentrations of all VOCs combined were "normal," i.e., below 5 milligrams per cubic meter of air. In some cases, however, levels exceeded 10 mg/m³.

Tsuchiya's group found that unlike the distinct copier fingerprint in some offices, the composition of VOCs in each house and some office buildings was an individual affair, depending probably on building design, materials, contents and occupant lifestyle. The most common types of VOCs found in homes included ethyl alcohol (suspected of coming from fungi), halogenated hydrocarbons (probably from refrigerators and dry cleaning solvents) and terpenes from building wood. There were noncopier VOCs in offices as well. In one office conference room, for example, Tsuchiya measured high levels of automobile exhaust and subsequently discovered that the building air intake was open to the parking lot. — S. Weisburd