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NASA Launches *Columbia* probe

Associated Press

Cape Canaveral, Fla.—Just before it disintegrated, the space shuttle *Columbia* experienced a sharp and sudden rise in temperature on its fuselage, NASA said Sunday.

The sharp rise was followed by increased drag on the spacecraft that caused its flight system to adjust its path.

NASA space shuttle program manager Ron Dittmore cautioned that the information was preliminary but said it could suggest that the thermal tiles that are designed to protect the shuttle from burning up during re-entry into Earth's atmosphere were damaged or missing, possibly from an episode earlier in the shuttle's flight.

"We've got some more detective work. But we're making progress inch by inch," Mr. Dittmore said.

Mr. Dittmore said the engineering data showed a temperature rise of 20°F to 30°F in the left wheel well of the shuttle about 7 min before communication was lost with the spacecraft. There was an even more significant temperature rise—about 60°F over 5 min—in the middle left side of the fuselage, he said.

The drag on the left wing began a short while later, causing the shuttle's automated flight system to start making adjustments.

Across Texas and Louisiana, meanwhile, officials were marking the exact satellite measures of the locations where debris was found in hopes it would help reconstruct the accident.

Mr. Dittmore said NASA engineers are still trying to recover 32 s worth of additional data from the flight computers. But he said the combination of new engineering data and an observer who reported seeing debris from the shuttle while it was still passing over California may create "a path that may lead us to the cause."

The shuttle broke up shortly before landing Saturday, killing all seven astronauts. Most of its debris landed in eastern Texas and Louisiana.

Earlier Sunday, NASA administrator Sean O'Keefe named a former Navy admiral to oversee an independent review of the accident, and said

investigators initially would focus on whether a broken-off piece of insulation from the big external fuel tank caused damage to the shuttle during liftoff January 16 that ultimately doomed the flight 16 days later.

Mr. O'Keefe emphasized that the space agency was being careful not to lock onto any one theory too soon. He vowed to "leave absolutely no stone unturned."

For a second day, searchers scoured forests and rural areas for over 800 km² of East Texas and western Louisiana for bits of metal, ceramic tile, computer chips, and insulation from the shattered spacecraft.

State and federal officials, treating the investigation like a multicounty crime scene, were protecting the debris until it can be catalogued, carefully collected, and then trucked to Barksdale Air Force Base in Louisiana.

The effort to reconstruct what is left of *Columbia* into a rough outline of the shuttle will be tedious and painstaking.

When any shuttle piece was located this weekend, searchers left it in place until a precise global position satellite reading could be taken. Each shuttle part is numbered; NASA officials say experts hope to trace the falling path of each recovered piece.

The goal is to establish a sequence of how parts were ripped off *Columbia* as it endured the intense heat and pressure of the high-speed re-entry into the atmosphere.

As engineers pinpointed the exact satellite location of debris, NASA said it had found remains from all seven astronauts who perished.

At least 20 engineers from United Space Alliance, a key NASA contractor for the shuttle program, were dispatched to Barksdale for what is expected to be a round-the-clock investigation.

Other experts, including metallurgists and forensic medicine specialists, are expected to join the investigation. Their focus will be on a microscopic examination of debris and remains that could elicit clues such as how hot the metal became, how it twisted, and which parts flew off first.

In addition to NASA's investigation, Mr. O'Keefe named an independent panel to be headed by retired Navy admiral Harold Gehman Jr., who previously helped investigate the 2000 terrorist attack on the *USS Cole*.