

## Major Safety Improvement for Space Shuttle Unveiled

*(Source: Voice of America news; issued Dec. 28, 2004)*

WASHINGTON --- The United States has taken a major step toward resuming launches of the space shuttle to the international space station next year. The space agency NASA says safety modifications have been successfully completed on the spacecraft's external fuel tank, the source of the problem that caused the orbiter Columbia disaster last year.

Improving the shuttle's external fuel tank is a key modification that NASA required before it would permit the grounded shuttle fleet to fly again.

An investigation by independent aviation experts found that a piece of hard foam insulation weighing less than one kilogram had broken away from a tank during Columbia's launch in January, 2003 and punched a hole in the shuttle's wing. The investigators say the hole caused the orbiter to burn up when atmospheric gases superheated by friction penetrated it during re-entry. The mishap killed seven astronauts, including an Indian-born and an Israeli crewmember.

Now a redesigned insulation system has been applied to the first external fuel tank built since the disaster. NASA fuel tank project manager Sandy Coleman says it is about to be shipped by barge from the manufacturer in Louisiana, Lockheed Martin Space Systems, to the shuttle launch site on Florida's Atlantic coast.

"We can taste victory here of shipping the tank," she said. "Shipping the tank is the first critical step on the path to safely returning to flight. This tank will be the safest, most reliable tank that NASA has ever produced."

Insulation covers much of the shuttle's external fuel tank to prevent the frigid hydrogen and oxygen fuel inside from causing the formation of exterior ice, which could break off and endanger the spacecraft during launch. The irony is that the foam itself caused this problem. In fact, the Columbia probe determined that bits of the hard foam had peeled off many external tanks since the first shuttle launch in 1981.

To fix the problem, NASA and Lockheed Martin engineers eliminated foam from places it was known to separate. Heaters are now located at key points to minimize ice buildup and the foam that is applied is attached by a new process. Cameras are also mounted on the tank to monitor its surface during liftoff.

Sandy Coleman says future foam losses should not exceed 13 grams instead of nearly a kilogram.

"Although we can never completely eliminate the foam from coming off the tank, NASA

and Lockheed have confidence in the extensive testing and the evaluation that we have completed to ensure that a situation similar to Columbia will not occur again," she noted.

The fuel tank improvement is among 15 major modifications the accident investigators ordered NASA to make before flying shuttles again. The space agency hopes to conduct a mission to test the changes by May or June.