"This cause of exploration and discovery is not an option we choose; it is a desire written in the human heart..."

– President George W. Bush, Feb. 4, 2003

RETURNING THE SPACE SHUTTLE TO FLIGHT

NASA will return Space Shuttles to flight with a mission on the Shuttle Discovery this summer. The crew of seven is charged with a busy to-do list, including testing new safety techniques and delivering much-needed supplies to the International Space Station. Discovery's launch is targeted for July 13 with a launch window that extends through July 31, 2005.

But Return to Flight is more than a single mission. It launches a new era of human exploration that's far-reaching but focused, ambitious but affordable. Return to Flight illustrates NASA's ability to learn from mistakes and its determination to prevent new ones. And it pays tribute to a crew of seven brave astronauts on the Space Shuttle Columbia, who two years ago gave their lives in the pursuit of the knowledge that comes from exploration.

Following the Columbia accident on February 1, 2003, the independent Columbia Accident Investigation Board conducted a thorough, seven-month inquiry. The CAIB issued its findings and recommendations in August 2003, in a comprehensive report.

The board determined that the physical cause of the accident was a breach in the Shuttle's left-wing leading edge caused by a piece of insulating foam that fell off the External Tank during the climb to orbit. This foam block, weighing approximately 1½ pounds and about the size of a suitcase, struck a portion of the wing covered in a dark, grey substance called Reinforced Carbon-Carbon, part of the Shuttle's heat-shielding Thermal Protection System. The damage allowed superheated air to penetrate the wing's interior and to weaken the structure, eventually causing Columbia's breakup 40 miles above central Texas, 16 minutes before landing.

Even before the CAIB final report laid out 15 recommendations to be completed before Space Shuttle missions could resume, the agency began the process of returning the Shuttle to safe flight by forming a team to plan for Return to Flight. The resulting document – reviewed and updated as those recommendations are addressed – is called NASA's Implementation for Space Shuttle Return to Flight and Beyond.

NASA did not stop by addressing only the 15 recommendations specified to be implemented prior to flying the Space Shuttle again. Another 14 recommendations from the Board are being implemented as well by NASA.

Additionally, the agency has gone above and beyond the CAIB recommendations with a list of 15 corrective actions known as "Raising the Bar" to make the Space Shuttle safer than it has ever been.

These initiatives combined mean NASA is addressing 44 issues leading to Return to Flight.

An independent group was formed by the NASA Administrator to evaluate how NASA is addressing the CAIB recommendations. This Return to Flight Task Group is conducting an independent assessment of NASA's implementation of those recommendations as they relate to the safety and operational readiness of Space Shuttle Discovery's upcoming mission, designated STS-114.

With long-range planning in the form of the Vision for Space Exploration announced in January 2004, the agency is beginning a new chapter in its history. It is recommitting itself to excellence in all aspects of its programs by strengthening its culture and improving technical capabilities.

Space Shuttle Columbia and its seven-person crew are never far from the hearts and minds of those

rededicated to making human space flight as safe as possible. NASA's strategies for safely resuming Shuttle flights are detailed in this section covering Space Shuttle Return to Flight safety enhancements. It serves as a guide to how NASA – its government and contractor workforce – has eliminated the potential for debris that could damage the Space Shuttle. It also details how the agency plans to identify, inspect and repair damage in flight, if needed, while improving technical excellence, internal communications and decision-making. And – in the very unlikely event that it's needed – the agency is providing a plan for keeping a Space Shuttle crew safe until a rescue mission could be launched.

NASA is committed to returning the Space Shuttle to flight -- safely -- to fulfill its mission in the Vision for Space Exploration.