

NASA reacts to study criticisms

TIM FURNISS/LONDON

NASA HAS PROMISED swift action following criticism in three separate reports of the space agency's Space Shuttle and "faster, better, cheaper" spacecraft programmes.

The Space Shuttle Assessment Team has criticised NASA for cutting staff at the Kennedy Space Center (KSC), saying that it has eroded safety – a "critical feature of the Shuttle programme".

The team was established after two potentially dangerous events during the launch of STS93 *Columbia* last July, when a short circuit almost forced the premature shutdown of one engine. In an unconnected event, hydrogen leaked from lines inside the nozzle

of one main engine throughout the ascent of the Shuttle.

NASA has started to take on 200 more workers, with 1,800 Shuttle-related workers expected to be on board within two years. The report also cites morale problems, loss of skilled technicians – which has overburdened remaining employees – NASA's overconfidence about the Shuttle's systems and management's mixed messages to workers – calling for cost cutting while promoting the importance of safety.

The Boeing-Lockheed United Space Alliance, which operates the Space Shuttle for NASA and employs 3,600 at the KSC, says it refutes some of the claims of the report and adds that it will be working with NASA to "evaluate its [the report's] technical accuracy".

Meanwhile, the Mars Climate Orbiter (MCO) Mishap Investigation Board report, initiated by NASA, and the Faster, Better, Cheaper, Report have been released. They indicate that the space agency is "trying to do too much with too little money and not enough oversight". Management must be held accountable, goals clearly set and, if the money is not available, programmes downsized, the reports suggest.

Projects should be planned and implemented more carefully, with a move away from a fixation on cost and near-term gain. The loss of the MCO and, later, the Mars Polar Lander (MPL) were a "wake-up" call, says the MCO investigation report. The MCO crashed into Mars, or was destroyed in the

atmosphere, because it made its approach at too shallow an angle before planned orbital insertion. A contractor had failed to convert measurements into metric units, and the failure was in not catching the mistake, the MCO report says.

The cause of the loss of the MPL is not known, with the report on this spacecraft loss yet to be issued. NASA has altered its Mars exploration plans, delaying its next lander by at least a year.

NASA administrator Daniel Goldin has praised the work of the investigations. "They have zeroed in on problem areas and have provided a roadmap for improving our performance," he says. The "faster, better, cheaper" philosophy was a cultural change, and "we knew this ... would not be easy," he adds. □

NEWS IN BRIEF

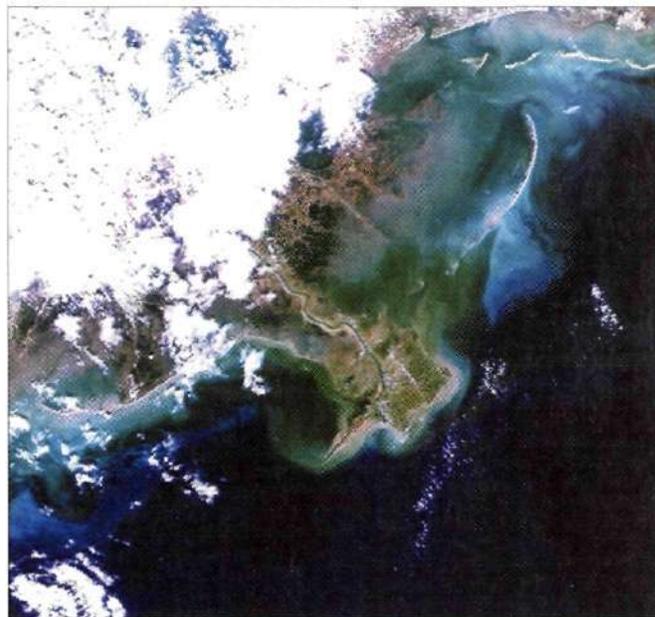
■ TEST ABORTED

The tenth of 14 test firings of a Boeing Rocketdyne XRS-2200 linear aerospike engine to be used on the Lockheed Martin X-33 advanced technology demonstrator was aborted 75s into a 220s test at the Stennis Space Center, Mississippi, on 9 March. The shut-down was caused by a change in the engine's controlling software.

■ SPACEPORT GUYANA

Citizens of Guyana have raised concerns with the national government about the possible imminent signing with US-based Beal Aerospace Technologies allowing it to establish a 10,530Ha (26,000acre), \$50 million, Spaceport Guyana launch site to operate the Beal BA-2 satellite launch vehicle. The site will be located in swamp land near Waini in the Essequibo region of the Caribbean state on the mainland of South America. French Guiana, to the east, is home to the Ariane launch site at Kourou.

First Terra satellite images released



NASA HAS RELEASED the first images from an array of instruments aboard its Earth Observing Systems flagship, Terra, which has reached its final 705km (440 miles) polar orbit following its launch on 18 December. They include the Mississippi Delta (shown above). The image was obtained by the polar-orbiting satellite's Moderate Resolution Imaging Spectroradiometer (MODIS), covering a 100km² (40 miles²) area over New Orleans, Louisiana, and the Gulf of Mexico. The image, made by combining three of the visible bands of the MODIS land surface reflectance imager, shows the river's channels in the delta, sediment plumes and differences in ocean colour between the shallow bays behind barrier islands and the open waters of the Gulf of Mexico.

Bristol satellite will be first since 1971

CANADA'S BRISTOL Aerospace has won a contract from the national space agency to build the country's first science satellite since 1971.

Called SCISAT 1, the craft will be launched in 2002 to study ozone depletion in the upper atmosphere, with particular emphasis on the atmosphere over Canada and the Arctic. The science instrument will be built by the University of Waterloo at Quebec City.

Meanwhile, the European Space Agency (ESA) has awarded Canadian company SED Systems a contract to build a 35m (115ft)-diameter telemetry, tracking and command centre at New Norcia, 140km (85 miles) north of Perth, Western Australia. It will monitor and control ESA's Rosetta spacecraft en route to the comet Witanen via Earth and Mars fly-bys after launch in 2003.

The New Norcia antenna will be ESA's first deep-space network facility to be controlled by its operations centre in Darmstadt, Germany. A smaller antenna is located at Perth, while others are sited in Belgium, French Guiana, Spain and Sweden. □