NASA review leaves projects on launch pad

Washington

All US spacecraft missions scheduled for launch this year are undergoing a sweeping review following a spate of high-profile failures that culminated in the loss of two Mars spacecraft last autumn.

Under the reviews, which have been ordered by Dan Goldin, administrator of the US space agency NASA, teams of NASA-appointed engineers are scrutinizing each project. Two launches have already been postponed, and others may be delayed.

After investigations into the Mars accidents had revealed a series of embarrassing mistakes and management lapses, Goldin directed the heads of his agency's field centres last month to take extra measures to ensure that missions in the pipeline don't have similar problems.

The Jet Propulsion Laboratory in California had already initiated a review of its Mars programme, while the Goddard Space Flight Center in Maryland responded by ordering independent 'Red Team' reviews of each project under its purview.

At least a dozen Earth and space science missions scheduled for launch in 2000 will undergo the review. These include IMAGE, Earth Observing-1, Cluster 2, the High Energy Solar Spectroscopic Imager (HESSI), TIMED, the Microwave Anisotropy Probe and Aqua, the second satellite in the Earth Observing System.

Mission scientists — many of whom are at universities rather than NASA centres — have mixed reactions to the NASA edict. Most say the additional checks can in principle help root out problems. But many worry that adding a major review so close to launch only disrupts projects with very tight schedules and cost margins.

HESSI, for example, is due to launch in July to observe solar flares at high-energy wavelengths. Run by the University of California at Berkeley, the $72 million Small Explorer mission is a shoestring operation by NASA standards, and has taken just two years to build.

Peter Harvey, the HESSI project manager at Berkeley, estimates that the project has already undergone 20 reviews. "To now have yet another review is killing us," he says, not because of the one or two days taken up by the Goddard team's visit, but because of the two previous weeks his staff will need to prepare for the review.

Just when project engineers should be focused on the launch, he says, they will be presenting graphs instead. "Our attention is turned away from the spacecraft."

A key assumption behind the 'better, faster, cheaper' approach adopted by NASA is that it dispenses with much of the red tape and bureaucratic requirements of past spacecraft missions, which were a major factor in driving up costs. NASA reviews were to be kept to a minimum. The low-cost missions were also understood to assume a certain risk of failure by not taking the time and money to build in redundant systems.

Delayed exposure: IMAGE is having to wait to study Earth's response to solar magnetic activity.

Some scientists facing Red Team reviews worry that NASA might change its rules in mid-stream following the recent mission failures. The Massachusetts Institute of Technology's $20 million HETE-2 satellite, for example, was to have been launched in late January from Kwajalein Atoll in the Pacific Ocean. It had already been mated to its Pegasus rocket and was preparing to ship out from California when NASA called off the countdown (see *Nature* **403,** 232; 2000).

Mission rules required that only one tracking station be guaranteed operational for launch. But the space agency decided it wanted two as a precaution. Although there had been no sign of trouble with the spacecraft, it was returned to the east coast for testing, and the launch has slipped to May.

NASA has delayed other launches for relatively minor reasons. IMAGE, which will study the Earth's magnetosphere, is managed by the Southwest Research Institute as the agency's first Midsize Explorer mission. It was to have been launched on 15 February. But after review teams questioned certain technical aspects of the project, the launch slipped to early March.

James Burch, the IMAGE principal investigator at Southwest, expects his spacecraft will ultimately be passed as fit. But he points out that NASA had long ago accepted the inherent risk of fast, cheap missions. "If somebody's going to say we don't want to take the risk of not having significant redundancy in the system, then that puts all these spacecraft in the museum," he says.

Although Burch, Harvey and other project heads say they understand Goldin's concern, they question how much review is enough, and whether the Red Team exercises are productive.

When a spacecraft loses its place in the queue, it can take months to get back to the launch pad. Burch estimates that keeping IMAGE on the ground past its scheduled launch date costs around $60,000 a day. But, he says, "if NASA is going to pay to slip things to make themselves satisfied that the risk is low enough to go ahead, then that's their prerogative".

Tony Reichhardt

Congress gets tough with gene therapy

Washington

Legislation to tighten up the supervision of federally funded human gene-therapy trials was introduced into the US House of Representatives last week. The move occurred on the day a Senate subcommittee hearing examined the problems of monitoring such trials.

The hearing was triggered by the case of Jesse Gelsinger, the Arizona man who died four days after receiving experimental gene therapy at the University of Pennsylvania (see *Nature* 401, 517; 1999). But the subcommittee explored other issues concerning clinical research in humans.

According to a spokeswoman, the proposed legislation, introduced by Dennis Kucinich (D-Ohio), had been drafted before Gelsinger's death. Under the legislation, authority for monitoring federally funded human clinical trials would be transferred from the Office for Protection from Research Risk, under the US Department of Health and Human Services, to an independent agency.

Arthur Caplan, director of the University of Pennsylvania's Center for Bioethics, argued that the rise in clinical-trial holds issued by the US Food and Drug Administration (FDA) indicates a general problem. The FDA issued few clinical holds in the eight years before 1999, but last year stopped at least five trials not involving gene therapy.

At last week's hearing, William Frist (Republican, Tennessee) said that systems to protect human subjects enrolled in clinical trials "are not working", and he was not

certain that new regulatory bodies would solve the problem.

The Gelsinger case revealed a failure to report adverse events in gene-therapy trials. After his death, the National Institutes of Health (NIH) asked researchers using adenoviral vectors — the delivery vehicle used in Gelsinger's trial — to report all adverse events.

Eventually, 652 became public (see *Nature* 403, **237; 2000**), including several deaths not directly attributed to gene therapy. Last week's hearing revealed 40 more adverse events, related to vectors other than adenovirus.

Researchers are required to report "serious and unexpected" adverse events only to the FDA, although they must disclose all adverse effects to the NIH's Recombinant DNA Advisory Committee (RAC).

Former RAC chair LeRoy Walters, director of the Kennedy Institute of Ethics at Georgetown University, testified that NIH's 1996 reduction of the RAC's powers had sent a "mixed message" to researchers, possibly indicating that they were no longer required to report to the RAC.

Walters also said that problems in securing a patient's informed consent revealed "a system-wide problem not unique to gene therapy". Paul Gelsinger, the patient's father, testified that researchers had not told his son that two monkeys had died on the experimental treatment.

Frist: safeguards "are not working".

The researchers had also incorrectly told Gelsinger that a previous subject had benefited from the gene therapy. The two problems were among 18 used by the FDA to to justify shutting down five other gene-therapy trials at the University of Pennsylvania (see *Nature* 403, **354; 2000**).

More inspections may prevent future problems, said Michael Blaese, chief scientific officer of Kimeragen, a Pennsylvania-based biotechnology company. Blaese, previously a gene-therapy researcher at the NIH, noted that trials on the NIH campus were audited frequently.

Jay Siegel, director of the FDA's Office of Therapeutics Research and Review, testified that the agency typically conducts on-site investigations as a drug or treatment nears approval. He said that the agency has begun to do spot checks at a "very limited" number of clinical sites. "We would like to do more." **Paul Smaglik**

Scientists reject blame for German genome shortfall

Munich

German scientists have rejected claims that lack of government funding for genome research is their own fault, for failing to convince politicians of its importance.

Although funding for the German Human Genome Project (DHGP) is expected to increase substantially next year, it will still fall well short of what many believe the country needs to compete internationally.

Walter Döllinger, a senior official in the research ministry, told a DHGP workshop last month that the scientific community and industry must share the blame for waning political support. Their lobbying activities have been ineffective, he said, and they have not put significant amounts of their own money into genomics research.

Döllinger said the research ministry is trying to maintain political momentum, which has slowed as government priorities changed. The ministry has drawn up a broad strategy paper for genome research that "covers the whole chain of innovation, from basic research to development". He expects it to be approved during the 2001 budget talks in June.

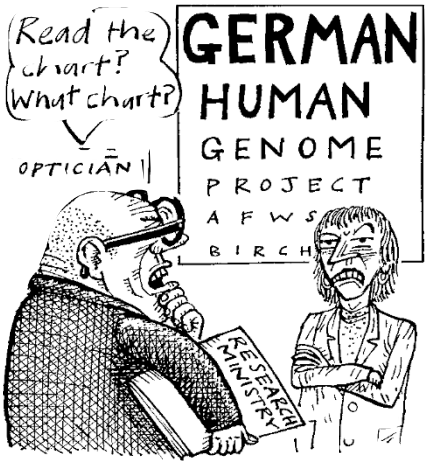
This extends an earlier paper, based on input from the scientific community, that was to have been launched last year. To the dismay of researchers, the paper was shelved, apparently because research minister Edelgard Bulmahn felt that it lacked a sufficiently strong political message to persuade the cabinet to provide the level of extra funding it demanded (see *Nature* **402,** 706; 1999).

The present paper brings together all the ministry's activities in genome research, including its new DM100 million (US$50 million) BioChance programme for start-up companies, along with the activities of research organizations such as the Deutsche Forschungsgemeinschaft (DFG), Germany's main granting agency, and the Helmholtz Society, which runs national research centres.

It proposes a "significant increase" — possibly more than 50 per cent, Döllinger indicated — in project money for the DHGP, currently around DM50 million a year. The paper also proposes setting up a genomics programme for microorganisms and a fund for 'competence centres' to reward interdisciplinary programmes linking research groups from different institutions.

The new package would be more politically convincing than its predecessor, said Döllinger. But researchers say that its scientific aspirations will not be met unless the government supplies a lot more money.

Detlev Ganten, director of the Max Delbrück Center for Molecular Medicine in Berlin and head of the Helmholtz Society, rejects Döllinger's claim that scientists have failed to shift funds from old areas of research. The Helmholtz Society has created a small strategy fund in genomics and intends to redistribute its own core funding in favour of genomics, he says. Its genome-related research will be evaluated next month by an international committee. The Helmholtz Society's senate will use the results in its decision on genomics strategies in May.



"The research ministry is very well aware of our activities," says Ganten. "It should not make up excuses to justify its own inactivity. It is naive to say that shifting our money would be sufficient; we need a lot of extra money."

The Helmholtz Society was a co-signatory of a report to the ministry which argued for a tenfold increase in public funding. Other signatories included major research organizations, such as the DFG, and the Förderverein, a consortium of German companies that support technology transfer from the DHGP.

DFG president Ernst-Ludwig Winnacker says he is "surprised" that Döllinger considers scientists' lobbying activities inadequate. He points out that the heads of all German research organizations have written detailed reports and campaigning letters to the ministry, and have launched an initiative to lobby parliamentarians.

"We have taken all opportunities to air the debate in newspapers and the most important political circles," says Winnacker. "Short of hiring a Zeppelin and flying it over Berlin, I'm not sure what more is expected of us."

Werner Schiebler, director of technology licensing and alliances at Aventis, says: "Industry recognizes its responsibility for supporting technology transfer and this is why we support the Förderverein by around DM1.5 million a year." But he adds that industry will only pay for basic research with clearly defined goals. **Alison Abbott**