

Researchers find silver lining in delay to work on space station

[WASHINGTON] An announcement last week by the US National Aeronautics and Space Administration (NASA) of a delay of up to 11 months in construction of the International Space Station may have angered the project's supporters in Congress. But it is good news for scientists, as the agency plans to fly additional research missions on the space shuttle now that it will not be tied up delivering pieces of the station to orbit.

The delay is needed to provide time for a key Russian module to be completed. The Russian government has promised that money will be forthcoming to complete the service module, which will maintain the station in orbit and house its initial crew.

But NASA managers say they will not know until next month whether the Russians can keep the promise.

As a hedge against this problem, NASA has decided to let the date of the first construction flight slip from November 1997 to no later than October 1998. If Russia defaults, the United States would have to build its own 'interim control module' to keep the station in the proper orbit during the early stages of assembly.

Even before the slip in the schedule, NASA had been looking for ways to placate scientists who have become increasingly frustrated with the lack of flight opportunities for their orbital experiments in the near

future. To pay for cost overruns in building the station itself, the agency has had to defer development of some of the science equipment it is planned to carry.

Facilities once planned to be available for use by researchers in 1998 have now slipped to 2000 or later. At the same time, NASA has cut the number of remaining shuttle/Space-lab research flights to two — a multidisciplinary Microgravity Science Laboratory (MSL) which flew last week, and the Neurolab mission devoted to neurological research, which will carry an international payload in collaboration with the US National Institutes of Health next March.

This squeeze meant that researchers who depend on data from space experiments faced a long 'dry' spell, according to Martin Glicksman, a materials scientist at Rensselaer Polytechnic Institute in Troy, New York, and chair of a National Research Council committee that oversees NASA's microgravity research. He says that some disciplines were looking at a hiatus of nearly four years without experimental data. "People cannot be asked to stand in a queue that long."

Last week's premature landing of the MSL Spacelab mission — due to a failed electrical fuel cell — made matters worse. Astronauts were scheduled to spend 16 days in orbit, conducting 33 life science and materials science experiments and testing experimental hardware to be used on the space station. Instead, they came home after only four days, completing what little work they could by flashlight to conserve electricity.

NASA immediately announced plans to reflly the MSL mission in July with the same experiments and crew. And now that the shuttle's short-term schedule has been freed by the station delay, the agency is considering additional flights in 1998 and 1999 devoted to research in life sciences, materials science and commercial product development.

Joel Kearns of the Marshall Space Flight Center in Alabama, who directs NASA's microgravity research programme, says the extra flights could either be reflights of existing MSL and Neurolab equipment, or newly developed equipment, which could fly either in Spacelab or in the privately leased Spacehab module. The agency hopes to fly some of the experiments it has already selected for the early station years on these shuttle flights instead.

The number of missions to be added, and how they will be financed, still has to be worked out between NASA, the White House and Congress. Money is scarce, particularly since the agency is asking

Canada swaps robot arm for lab space

[MONTREAL] Canada has agreed to build a vital component of the International Space Station in exchange for access to its laboratories under an arrangement announced after a meeting between the Canadian Prime Minister, Jean Chrétien, and US President, Bill Clinton.

Canada has already designed the Special Purpose Dexterous Manipulator (SPDM), which will handle small payloads such as batteries and computers, and operate small robotic tools for delicate maintenance tasks. But it was having difficulty finding the annual operating costs of about Can\$22 million (US\$15.8 million) required to use the space station's laboratories once they are in operation.

The deal is a trade-off, giving Canada a 2.3 per cent stake in the station's research capacity in return for reducing US construction costs, at a time when the space station's budget has been capped at US\$2.1 billion. But one of the reported implications is that Canada will have to withdraw from its associate membership

of the European Space Agency for several years.

Alain Poirier, the Canadian Space Agency's director-general for space systems, is responsible for the country's space station programme. He says that Canada had been given until this month to decide whether to provide the special purpose manipulator.

"If we had decided not to do so, NASA would have done it," says Poirier. "What was at stake was our leadership in space robotics." He adds that Canada also wanted "to use that to leverage our participation in the space station programme".

The manipulator is a successor to the 'Canadarm', used in the US space shuttle programme. It is a smaller, two-arm robot capable of the delicate assembly tasks at present done by astronauts during spacewalks. It will reduce the number of spacewalks required by providing the crew with telerobotic capability from inside the station.

Poirier says a large part of the C\$170 million needed to build SPDM will come from a contingency fund designed for new initiatives in Canada's

Long-Term Space Plan II, which covers 1994–2004. The rest will come from a reallocation of funds "to address new priorities".

He says it was "quite a challenge to fund a programme of the magnitude of the SPDM", but that the contingency funding has not been exhausted as a result. Nor will it be necessary to use funds from Long-Term Space Plan III for SPDM, as some had feared. That plan is still being formulated.

Ralph Nicholls, chairman of the Canadian advisory committee for the space station during its first five years, says he recognizes Canada's need to compete in space technology through the space station. But he says there is little in the programme for traditional space scientists. "There is a distinct lack of interest [among those in] space sciences, upper atmosphere research, space physics, space astronomy," he says.

According to Poirier, microgravity experiments have been funded under the second long-term space plan, but additional money for science projects will have to come from the third plan. **David Spurgeon**