Politics and finance delay US space station

■ Partnership problems still unresolved
■ Price tag too high even for Japanese

Washington/Tokyo/Paris

THE European Space Agency (ESA) council last week approved the memorandum of understanding that defines European participation in the space station. As Canada has already come to an agreement, this makes Japan the only partner in the project yet to reach that stage, and could leave it out of discussions beginning later this month on specific hardware requirements.

Both Canada and ESA participation in the space station have been covered by extensions of earlier memoranda that had been due to expire at the end of last year. But the National Aeronautics and Space Administration (NASA) extended the agreements pending formal approval.

In fact, ESA will not sign the new memorandum until all its member governments sign specific intergovernmental agreements with the United States. Although these agreements have also been worked out in principle, ratification will take some time.

For the Japanese, a problem has arisen between the Science and Technology Agency (STA) and the Foreign Ministry over which agency should sign the memorandum. Masahiro Kawasaki, director of STA's research and development bureau, says there is no dispute, and that "coordination discussions" should resolve the issue by early April. But NASA is not sufficiently convinced that the problems are minor, and for the time being Japan is excluded from participating in any space station meetings. This could mean that when Japan does join in, it will have to accept the engineering configurations the other partners decide upon.

Even in the case of Japan, the fundamental problems that had held up international participation — most notably the Pentagon's wish to keep open the option of using the space station for military purposes — have now been resolved, but financial problems remain. The Reagan administration's 1989 budget seeks $1,000 million for the space station, and an overall increase in the NASA budget of $2,500 million. But the House of Representatives Budget Committee has already indicated that NASA's increase is likely to be only half that large, and some of that reduction will surely come out of the space station's allocation.

Budget problems are also threatening Canada's participation in the space station. Canada's financial contribution to the project had originally been set at $C800 million. But fluctuating currency exchange rates and refinements in hardware specifications have boosted that figure to approximately $C1,200 million. An Ottawa decision to place a strict cap on spending has also meant that difficult choices must be made on how to provide the extra money. The Canadian government has refused to rule out the possibility of withdrawing from the project entirely.

Canada faced particular problems in working out its memorandum of understanding for participation in the space station. ESA's man-tended free flyer, attached pressurized laboratory and polar orbiting platform and Japan's experiment modules with pressurized and unpressurized segments, can all be isolated from the rest of the station, should a proposed military use not be acceptable.

But the Canadian Mobile Servicing Unit is part of the station's infrastructure. Establishing a dispute resolution system was a prime concern for Canada, and in practical terms Canada will find it difficult to enforce its point of view once the station is in orbit.

The current reorganization of governmental science policymaking agencies has also complicated Canada's space posture. At the moment, Canada has no space agency. Instead, space activities are distributed among several ministries, including Communications, Engineering and Mines, the Ministry of State for Science and Technology and the National Research Council. There has been a long-standing plan to form a space agency, and a transition team led by Arthur Collin was formed to that end. But after more than a year there is still no clear plan for which ministry should be the permanent home of the space agency, and Collin has resigned. There is even a debate over the location of the agency, with a regional dispute started by Montreal to wrest it from Ottawa.

Further to confuse matters, Canada is merging its Ministry of State for Science and Technology into a larger department that will be headed by Industry Minister Robert de Cotret. Two weeks ago, de Cotret indicated there might not be a space agency if Canada does not participate in the space station. But last week, his junior colleague, Science Minister Frank Oberle, seemed to be saying that the space agency would be set up anyway.

Joseph Palca, David Swinbanks & Peter Coles

CFCs cause part of global ozone decline

Washington

ATMOSPHERIC ozone levels at middle and low latitudes decreased by 2.5 per cent between 1978 and 1985, and some part of the depletion has been caused by chlorofluorocarbons (CFCs), according to the Ozone Trends Panel, a committee set up to re-examine existing data from satellites and ground stations. These findings, announced last week, are less alarming than earlier estimates of a general decrease as large as 1 per cent per year, but nevertheless cannot be explained solely as the result of changing solar activity.

The Ozone Trends Panel (OTP), an international group of atmospheric scientists, was set up in October 1986 by the National Aeronautics and Space Administration (NASA) and other agencies in response to claims made before Congress by Donald Heath, of the NASA/Goddard Space Flight Center, that ozone levels were decreasing globally at an inexplicably high rate. Heath derived his results from satellite measurements only, the difficulty being that a known deterioration in the instruments had to be accounted for to obtain the true ozone trend. By contrast, OTP compared the satellite data with measurements from several ground stations to deduce a more reliable calibration, and arrived at an ozone loss rate of 2.5 per cent from 1978 to 1985.

According to OTP, anything from 0.7 per cent to 2 per cent of this total could be the result of diminishing ultraviolet radiation from the Sun, which reached the minimum of its eleven-year sunspot cycle in 1985. Robert Watson, project manager at NASA, is now certain that trace amounts of CFCs are responsible for the remainder of the decrease. As the Sun's activity increases towards Solar Maximum in 1991, ozone levels may hold more or less constant, but then the decline will resume.

A more worrying part of OTP's report is that at high northern latitudes, between 50° and 60°, ozone concentration has fallen a little faster, to the extent of 6 per cent since 1970. This is too much to be explained by gas-phase CFC reactions alone, and may imply that a smaller version of the Antarctic ozone hole, which is instigated by reactions on ice particles, is appearing around the North Pole. This new finding, says Watson, adds impetus to investigation of the atmospheric chemistry of the Arctic (*Nature* **331**, 201; 1988) because it is important to discover if the mechanism causing the northern depletion might be of global significance.

David Lindley