

## Japanese broadcasting satellites

# Toshiba pays price of failure

Tokyo

THE successful launch last Wednesday of Yuri-2b, Japan's second direct television broadcasting satellite, has not quietened critics of the project. A series of delays and failures had slowed progress and raised costs. One casualty had been the Toshiba Corporation, the main contractor. In an unprecedented move, it has been dropped from the project and replaced by NEC.

Another casualty might be said to be the general public, because the satellites are intended for the national broadcasting service, NHK. One newspaper urges its readers to ask how much money has been poured into the project next time the man from NHK comes around to collect payment of the television licence.

Problems really began to attract notice when the first broadcasting satellite, Yuri-2a, broke down soon after it went into operation in May 1984, leaving only one of its three transponders functioning (see *Nature* 309, 295; 1984). The fault seems to have been in travelling wave tubes designed to beam television signals to the Japanese islands and supplied by a French and a US company. These failures provoked furious complaints to the visiting US Vice-President George Bush about the quality of foreign workmanship. And to take the blame the president of the National Space Development Agency (NASDA) was forced to resign.

Next, it was decided that Toshiba would be replaced as prime contractor by NEC for future broadcasting satellites. This is a serious blow to Toshiba and may put it out of the satellite business altogether. Japan's three long-term satellite development programmes, in communications, broadcasting and weather observation, had been given out one each to Mitsubishi Electric, Toshiba and NEC so that each can independently acquire sufficient expertise eventually to compete with each other and with foreign companies. NEC will now continue the broadcasting series. Next in line are the BS-3 satellites which will be launched at the end of the decade. They are intended to broadcast high-definition television (HDTV) signals which will give a picture quality as good as 35-mm film projection.

It may be that much of the high cost and the failure of the broadcasting satellite programme is due to the particular development strategy Japan is pursuing. Satellites can be bought much more cheaply abroad than they can be built in Japan, even though only a third of the components of the Yuri satellites are Japanese. But satellite imports have been banned in order to allow domestic industries to master construction technology.

The rush to build broadcasting satellites — Yuri-2a was the first in the world — is intended to provide a lead in direct broadcasting technology. In particular, Japanese companies are looking at the potentially huge market for the roof-top parabolic antennas and decoders needed to pick up satellite transmissions.

In order to make these small and easily marketable, the Yuri-2a satellite's transmitters were much more powerful than had previously been tested in space. It was these that broke down. The just-launched Yuri-2b satellite has the same equipment aboard but all has been checked and rechecked, putting back the launch date by six months. That in turn has delayed other launches and the testing of the new H1 rocket with its home-developed liquid

## Malaria vaccines

# Biogen revives forgotten project

COMMERCIAL interest in the production of a malaria vaccine has taken another turn with the decision of Behringwerke AG, the subsidiary of Hoechst AG based in Marburg, West Germany, to take over a project started by Biogen, the Boston and Geneva-based biotechnology company, which has been through a bad patch.

Indeed, the Biogen malaria vaccine project was a casualty of the company's problems over a year ago which led to a 20 per cent cutback in staff, and the removal of both Professor Walter Gilbert as chief executive officer and Dr Julian Davies as research director in Geneva.

For the past year or so, malaria vaccine work at Biogen has continued only because members of staff are allowed to spend 20 per cent of their time on their own projects and because of collaborations with Dr Luc Perrin at the Geneva Blood Centre and Dr Bernard Mach at the University of Geneva.

The result, say observers, is that the Biogen project has fallen behind its rivals and that the company has been lucky to strike a deal with Behringwerke.

The Biogen approach to a vaccine has concentrated on the blood-borne stage (merozoite) of the *Plasmodium falciparum* parasite, and particularly on a large protein that is exposed on the merozoite's surface. Wellcome Biotechnology in Britain and Hoffman-La Roche in Basel, in collaboration with Dr John Scaife's group at the University of Edinburgh, are pursuing the same approach, but seem to be considerably closer to a real test of whether the protein will protect experimental monkeys against malaria.

Other merozoite proteins are being investigated as vaccines at the Walter and

oxygen/hydrogen engine.

Delays have also lessened the chances of international acceptance of the HDTV standards developed in Japan. It was hoped that speedy development of the BS-3 series would enable NHK to introduce high-definition broadcasts before anyone else, and to seize the initiative in setting international standards. The present satellite will be used for experiments with such television broadcasts and super high-fidelity FM digital broadcasts. Its main purpose however, will be to eliminate poor reception in outlying and mountainous regions of Japan.

Whether lost time can now be made up depends on the success of the satellite when it is switched on in a couple of months. The satellite's insurers are clearly not totally confident — the premium has been increased to 30 per cent of the satellite's value from the 12 per cent set for the previous satellite.

Alun Anderson

Eliza Hall Institute of Medical Research in Melbourne, Australia, and in Sweden at the University of Stockholm. And vaccines based on proteins on the surface of the sporozoite stage of the parasite, the form in which it is passed from the mosquito into the blood stream, are in an advanced stage of development both at New York University, probably in conjunction with Hoffman-La Roche, and at the Walter Reed Army Institute of Research in Washington, DC, in conjunction with Smith Kline and French Laboratories.

It is no coincidence that the military are involved in the last project, for it is military personnel who form one of the prime targets for vaccination, at least where money is no object. A second group in the same category are travellers from developed countries to areas where malaria is endemic. Figures that emerged in London last week show the steady rise in cases of malaria among that group. Over 2,000 cases of malaria among travellers from Britain were recorded last year and 85–90 per cent of the cases were the result of failure to take medication as instructed. If ever there is an effective vaccine, that problem would be solved.

While Behringwerke tries to make the most of Biogen's malaria work, Biogen is developing a new strategy under its chief executive of two months, James Vincent. His first task is to improve the financial position of the company, which took a considerable turn for the worse to judge by the year-end figures released last week. Total revenues for 1985 at \$21 million were \$10 million down on 1984, giving a net loss in 1985 of \$19 million compared with \$13 million in 1984. Peter Newmark